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A PRELIMINARY NOTE ON "BROWN BAST."

By W. N. C. Belgrave.

A FUNGUS has recently been demonstrated in this laboratory, occurring in the bark of Hevea trees suffering from "brown bast," or "water-logged bark"; and also in the bark of trees which had apparently recovered from "brown bast" but which had become "burred," as so often happens.

The fungus is a member of the lowly order Plasmodiophoraceæ and is apparently a new species of *Spongospora*. Fungi of this order are quite unrelated to the genus *Phytophthora*, and one of their members, *Plasmodiophora*, is the cause of "finger and toe" of turnips. No *Phytophthora* has been found in any of the specimens examined.

Inoculation experiments have not yet been carried out, but the mode of occurrence leaves little doubt that the fungus is the cause of the disease.

Fungi belonging to the Plasmodiophoraceæ are all dwellers in the soil, especially in wet, acid soils; and in view of the certainty of primary infection from the soil either directly, or by rain splashes, this early note is written to warn planters that no treatment, curative or preventive, which leaves the soil factor out of account, is likely to be of permanent value. Removal of diseased tissues by stripping or scraping will probably be necessary; but not sufficient.

The general field method of soil sterilization is by heavy liming combined with drainage and cultivation, and it is possible that such treatment will be effective in this case. Owing to the nature of such fungi, which have no hyphæ and are distributed through the soil independently of roots, etc., trenching would be useless.

Primary infection from the soil does not exclude secondary infection through other agencies—*e.g.*, tapping knives from tree to tree, hence preventive painting may play a part in reducing the spread of the disease.

Work on the life history of the fungus, and on the many practical points raised, is in hand, but it is unlikely that definite results will immediately be attained. Meanwhile, all trees suffering from "brown bast" or burrs should be regarded as possible sources of infection, and left untapped.

Note.—As a result of work done since the above communication went to press it seems likely that the identification of the organism as a member of the Plasmodiophoraceæ is wrong, and it is not impossible that it will eventually be identified as one of the lower forms of Algæ.

The scheme of experiments with a view to prevention remaining unaffected.

NOTES ON BARK CANKERS AND THEIR TREATMENT.

By W. N. C. Belgrave and F. de la Mare Norris.

(*The following notes, which were distributed to planters as a memorandum in July last, represent the views then held—Ed.*)

BARK disease in Malaya is increasing, and greater precautions will be necessary in the future than have been taken in the past. Although much remains to be done, enough has been accomplished to enable the suggestions in this memorandum to be made with some confidence. Although they are not regarded as final, changes are unlikely to be more than those of detail.

There are three bark diseases to be considered:

(*a*) "Claret-coloured" bark canker or "Patch canker";

(*b*) "Black-stripe" canker;

(*c*) "Mouldy rot."

(*a*) "CLARET-COLOURED" BARK CANKER OR "PATCH-CANKER."

A canker of virgin or renewing bark, occurring in patches at any point from the collar to the fork. If the cankered area is not within the tapping area, the disease is not detected till a late stage, when the bark splits and a greenish-yellow fluid may exude. The tissues beneath will be found rotted down to the wood and borers often enter. If the tapping cut comes into a cankered area, the disease may be discovered earlier, on the cessation of the flow of the latex. The internal bark tissues in the early stages have a sodden, reddish-brown appearance, becoming later chocolate-coloured or nearly black. The "claret-colour" which gives the disease its name is seldom found in Malaya, and it has been pointed out that confusion is likely to arise which may lead to the cutting out of perfectly healthy renewing bark, which more often than not *is* claret-coloured—it is most important to note that, when diseased, Hevea bark presents a sodden, dirty appearance. To avoid the risk of such confusion the name "patch-canker" (the Dutch "Vlekken kanker") is to be preferred.

(The names adopted for (*a*) and (*b*) are believed to be those given to similar diseases in other countries, but much uncertainty exists, which is unlikely to be cleared up till some one worker visits all the countries concerned.)

If taken at an early stage, the disease may be treated by scraping until the latex exudes, and painting with Jodelite and tar. If the disease has reached the cambium, all diseased tissues must be excised down to healthy wood, before Jodelite and tar are applied. Where the cankered area is extensive and the disease of long standing, it is best to cut the tree out.

Excised parts should be burnt as soon as possible; it is best to cover with tar and oil before cutting out, for greater safety. These precautions apply to all cankered and indeed to all diseased tissue.

Of great importance with this and all bark cankers, is immediate cessation of tapping on diseased trees. It should be an invariable rule that trees which have gone dry should be examined for bark cankers. To start a new cut on a diseased tree is to court trouble.

So far, there has been no epidemic of "claret-coloured" bark canker on any estate. Further work may show the desirability of some system of preventive painting, but in the present state of our knowledge, the measures outlined above are all that can be recommended.

The causal fungus has not been isolated in this laboratory but is reputed to be *Phytophthora faberi*, the cause of cacao canker.

(*b*) "BLACK-STRIPE" CANKER.

Also known as "bark-rot," "cambium-rot," or "black-line." The last name is liable to cause confusion with *Ustulina zonata*.

"Black-stripe" is a disease of the tapping area, very difficult to detect in the earlier stages. Short linear depressions are noticed about $\frac{1}{2}$ inch above the tapping cut—if these be cut into, dark lines are found in the bark tissues beneath. The lines extend into the wood, and even in early stages of infection may have penetrated to a depth of $\frac{1}{2}$ to $\frac{3}{4}$ inch. Soon the lines in the wood extend, forming vertical stripes or bands which may be several inches long, although represented on the exterior by a small depression less than $\frac{1}{2}$ inch in length. Later the depressions may coalesce and spread, forming "wounds" on the tapping surface. The fungus frequently travels below the tapping cut into untapped bark.

A fungus—a species of *Phytophthora* has been isolated from the diseased wood, and inoculation experiments have shown it to be the causal fungus, and to be strongly parasitic—the percentage of successful inoculations on recently tapped bark being 100.

The fungus appears to differ from *Phytophthora faberi*, said by Pratt (*Agricultural Bulletin, F.M.S.*, Vol. V, Nos. 5 and 6, February, 1917) to be the cause of "black stripe" in Sumatra, and agrees closely with the unnamed species described by Dastur (*Memoirs, Department of Agriculture, India*, Vol. VIII, No. 5, November, 1916) as the cause of "black-stripe" in Burma.

In other countries, the fungus is reported to be confined to the bark; in Malaya penetration of the wood is usual, deep and rapid; and both vertical and horizontal spread of the fungus is much more rapid in the wood than in the bark.

Factors Affecting Distribution.

In damp weather the mycelium of the fungus grows over the surface of the diseased area, and sporangia are produced there. Such weather is an important factor in accelerating the spread of the fungus, but is not essential for its continuation.

The sporangia are too heavy for wind distribution, but may be carried by insects, tapping knives, or coolies' hands. These agencies may also readily distribute the disease by carrying bits of diseased tissue or of mycelium.

In Burma, the fungus causing "black stripe" has been found to cause a "black rot" of fruits. This has not been observed here, but will be looked for this season.

One of the peculiarities of "black stripe" in this country is the existence of a few scattered cases of the disease on many estates without any spreading taking place. Suddenly, especially after a spell of wet weather, an epidemic may break out starting from those trees.

This disease can be as serious on quite sanitary estates as on overcrowded ones (although it is more easily eradicated on the former). No connection can be traced between deep or light tapping and prevalence of the disease, but a very flat tapping cut is more likely to retain moisture in wet weather than one more steeply inclined.

Treatment.

Thinning out on overcrowded areas should be undertaken. The tapping of diseased trees should immediately be stopped, and speedy treatment, by excision of the diseased tissues—bark and wood—undertaken, the exposed tissues being painted with Jodelite or Solignum and tar.*

It was hoped that it would be found possible to employ gouges for removing diseased tissues, thus causing the least possible waste of bark; this, in the majority of cases, has proved to be impracticable, owing to the extension of the disease in the inner tissues.

The method of excision found most useful is chiselling, a strip of tissue of a size sufficient to include the whole diseased area being removed.

In the majority of cases, superficial painting, or painting after light scraping, has been found to be useless as a cure for this disease, no paint penetrating deeply enough to kill the fungus, which continues growing in the wood, to re-appear when tapping is resumed.

If only a few diseased trees are found, this treatment may be sufficient; if large numbers are found, or if the disease is on the increase, some preventive measure must be adopted.

Preventive Measures.

It has been found that the path of spread of "black stripe" often coincides with the path of the tapper. This led to the idea that the fungus was spread by tapping knives, and the hope that sterilization of knives would control the disease. A five per cent.

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* It appears that very slight infection may be thrown off without treatment, especially in good weather. Tapping of such trees must of course be stopped, and they should be marked and watched for signs of spread of the disease.

Cutting out is the theoretically perfect remedy, and should certainly be applied during an epidemic, or wherever the stripes show signs of deep wood penetrations, say more than $\frac{1}{8}$th of an inch, or of extending below the tapping cut.

solution of formalin was advised for this purpose. Although this measure was reported to be successful in a few cases, it was found insufficient on most estates suffering from "black stripe" in epidemic form.

This failure indicates other means of distribution to be active, of these, the one which most readily suggests itself, is spread by the tappers' hands, which almost inevitably come in contact with the diseased surface. It is not improbable that insects may assist.

It follows that some more comprehensive measure must be adopted. Such a measure is the coating of the recently tapped bark with a layer unsuitable to fungoid growth. Preventive painting has for its object the production of such a layer. Any non-volatile antiseptic would serve this purpose, but essential consideration are cost, effect on bark, effect on scrap, and colour of solution. Owing to the war, a further consideration, the local stocks available, is introduced.

The cheapest antiseptics are probably the numerous disinfectants and wood preservatives—*e.g.* Izal, Jodelite, etc., which have as their active constituents tar products of some sort—phenols, cresols, etc.

Many inorganic antiseptics are ruled out by high prices—*e.g.*, the extremely active corrosive sublimate, and others by their reactions —*e.g.*, potassium permanganate.

The most widely used fungicides are copper salts (as Bordeaux or Burgundy mixture) and compounds containing "active" sulphur (lime-sulphur, liver of sulphur, etc.)

At present copper compounds are not readily obtainable, and there is considerable prejudice against their use, owing to the supposed spoiling of rubber due to traces of copper compounds in the latex.

Sulphur compounds are open to the objection that unknown and varying quantities of sulphur may be added to the scrap—further, in temperate countries lime-sulphur has not proved very successful against *Phytophthora* diseases.

[Many estates are using a paste of lime, sulphur (flowers) and water. It is unlikely that this has any greater fungicidal action than lime wash alone. "Lime-sulphur" solution is a red solution containing the sulphur either as polysulphides, or in an extremely finely divided "active state."]

Formalin has the advantage of being harmless to rubber, but the disadvantage of volatility. To overcome this, it is mixed with sodium bisulphite (itself innocuous), with which a relatively stable compound in concentrated solution (such as is quickly produced on the tapping cut by evaporation) is formed. This compound slowly breaks down, with liberation of formalin.

The choice therefore lies between "formalin-bisulphite" and one of the tar products of which the most useful for this purpose are Brunolinum, Carbolinium and Izal. Of these, the first gives a dark-coloured emulsion with water, the two latter light-coloured emulsions. Formalin-bisulphite is a colourless solution.

The dark colour imparted to the bark by Brunolinum in strong solution renders supervision easier, but has the grave disadvantage of obscuring subsequent fungus attacks. The "tarry" paints are sometimes found to damage the scrap.

It is certain that none of the paints, used in the concentrations given below cause any *immediate* injury to the renewing bark but the future effects remain to be discovered. Bearing in mind the known harmful effects of the vapours of the tar products on leaves and buds of many plants, and the proneness of Hevea to burring, scaling, etc., it seems not unlikely that continuous application of the "tarry paints" *may* cause trouble in the future.

The use of formalin-bisulphite is not open to these theoretical objections, but time alone can settle these points.

SOLUTIONS.

(*a*) *Carbolinium* ... ... 4- 8 per cent. in water

(*b*) *Izal* ... ... 5-10 „ „

(*c*) *Brunolinum* ... ... 10-20 „ „ with addition of soft soap, 1 lb. to 4 gallons of water to promote mixing.

(*d*) *Formalin- Bisulphite.*—1¼ lbs. sodium bisulphite dissolved in ½ gallon water and 1 pint formalin (as purchased) added. This forms the stock solution and should be kept in a stoppered vessel. For use it should be diluted with water to ten times its volume—*e.g.*, ½ gallon to 5 gallons.

APPLICATION.

The susceptible area may be regarded as the tapping cut and a strip of bark 1½ inches to 2 inches wide above it. Any painting should aim at covering such a strip as completely as possible. Beyond these limits a sufficiently thick layer of cork tissue will have been formed to prevent invasion by *Phytophthora.*

Preventive painting must be carried out as often as necessary to kill all fungus tissue on the painted area (whatever its mode of distribution), before it has penetrated the bark. In view of the extremely rapid action of fungus causing "black stripe" canker, to be effective, painting must be done as often as the tree is tapped—*i.e.*, daily or on alternate days. Painting at longer intervals represents money thrown away, as far as "black stripe" is concerned.

Painting is best carried out at the time the latex is collected and by the same cooly. Pratt in the *Agricultural Bulletin, F.M.S.*, Vol. V, No. 5, describes a very efficient routine for this purpose as follows:

"Portable receptacles for the solution may be made from bamboo. Pieces about 10 inches long with two joints are best. The transverse portion (the inner part) of one of the joints is removed. This is a practical and cheap vessel for the transport, in the field, of the fungicide. It is applied with a brush made of rotan. Eighteen inches is a convenient length. About an inch of one end of the rotan is well crushed between two stones or in any other convenient way. This end is used to apply the liquid to the tree.

"The method of application, if done at the time of collection, is as follows: The bamboo receptacle with the fungicide is attached with string or wire to the latex cup. The brush is placed within the bamboo container. After the cup of the latex has been emptied into the collecting can, the brush is drawn once along the entire length of the tapping cut beginning at the higher end . . . . the part of the can to which the bamboo container is attached must be nearest the tree. If this is not done, and the brush is continually lifted over the top of the can, drops of Izal fall from the brush into the collected latex causing it to coagulate . . . .

"To disinfect 600 trees at the time of collection delays the tapper on an average of half an hour. . . . . At first fully an hour must be allowed." (Or, of course, the task must be reduced.)

Working on these lines an estate in Malaya, clear of timber, on flat land, with daily tapping, Tamil labour and about 100 trees per acre, averaged 20 cents per acre per month.

It must be emphasized that although preventive painting gives valuable results, absolute immunity is not attained, and the strictest possible watch must be kept for fresh cases.

If it were possible always to paint before the scrap has coagulated, sterilization of knives would not be necessary. This is, however, not always practicable, and there is a danger that the fungus may remain under the scrap untouched by the paint. Experiments are in progress to determine whether the danger is a real one, in the meantime, it is better to sterilize the tapping knives in addition to preventive painting, during an epidemic.

It is realized that the measures outlined above, involve an increase of expenditure and, of greater importance in many districts, of labour. It cannot, however, be too strongly urged that once "black stripe" has appeared in epidemic form on an estate or in a district, few sacrifices can be considered too great in getting rid of it.

The alternative to the above measures in epidemic areas is total cessation of tapping and treatment by excision of individual diseased trees.

Caution is necessary when the outbreak appears to have been overcome. It is suggested that painting be continued for at least two months after the last case is noticed, and then stopped in blocks, at intervals of say three weeks.

The effect of wintering is deceptive. The increased illumination of the tapping surface appears (as might be expected) greatly to reduce the number of fresh infections, but with the reappearance of the foliage the number rises again.

"MOULDY ROT OF RECENTLY TAPPED SURFACE."

This disease usually starts as a series of small discoloured blotches, which afterwards spread and join up to form an irregular band, parallel to and about an inch above the tapping cut. The diseased tissues rapidly darken and become covered with a greyish bloom. This "bloom," which is particularly noticeable on wet mornings, consists of a mixture of fungi—those appearing most

consistently being *Cephalosporium* sp. and *Sphaeronema* sp. At one time it was thought that these were saprophytes and that the damage was probably done by some species of *Phytophthora*, but inoculation experiments indicate the *Sphaeronema* as the causal fungus.

When neglected the disease penetrates into the wood, usually to an average depth of about $\frac{1}{8}$th inch. Depressed patches are formed in the bark, these finally cause exposed areas somewhat similar to tapping wounds. The internal limits of this disease do not usually extend beyond the external indications. In old cases dark lines have been observed extending up and down in the wood beneath the tapping surfaces. All such cases had been treated with Jodelite and it has not yet been ascertained whether these lines are of a fungoid nature or due to treatment. These dark lines should not be confused with those occurring in black stripe canker, in the latter they consist of discoloured vertical bands of cells, in the case of mouldy rot they are hair-like and apparently confined to individual vessels.

Field observations suggest that the causal fungus, whatever it be, is a slowly growing parasite, and that an epidemic need only be feared when conditions adverse to the rubber tree obtain. Such conditions are, overcrowding, bad tapping, poor renewal, and neglect of the disease. So far serious outbreaks have been confined to one district in Negri Sembilan. A close connection has been observed between the distribution of the disease and the prevalence of some or all of the factors mentioned above. Healthy trees with a good bark renewal have been found in the majority of cases to throw off the disease.

Treatment and Prevention.

In badly infected areas thinning out should at once be undertaken. Suggested limits being, 75-90 trees per acre, in areas 10-15 years old: 90-120 in areas 7-10 years old: and up to 140 in areas below 7 years old. During the thinning out the opportunity should be taken of removing as many of the diseased trees as is practicable.

The only safe treatment of the individual tree is the complete excision of the rotted tissues and the painting of the exposed surface with Jodelite and tar. Trees so treated should be rested for at least a month and re-opened on a new cut; a careful watch should be kept for any recurrence of the disease.

It is possible that the only absolute effective prevention of the disease, at least in the badly infected areas, will be by daily painting, but realizing the difficulties of instituting such an undertaking in the district where the disease is at present most prevalent and taking into consideration the relatively slow growth of the fungus it is advised that a minimum weekly painting be undertaken in affected areas and painting as labour will permit in adjacent areas.

When painting of this nature is undertaken one of the tarry paints such as Brunolinum or Carbolinium is advised. The painting of a strip of bark about two inches wide should be sufficient. The method of painting and concentration of solutions is as for "black stripe."

Preventive painting has here been advised only for estates or areas suffering from epidemics of "black stripe" or "mouldy rot"; and it is unlikely that it will come into extensive use outside such areas at the present time.

Unfortunately, it is not to be expected that outbreaks of "black stripe" will become fewer. World-wide experience has shown that as the density of the population of any organism, animal or plant, in a country increases, the number and distribution of epidemic diseases increases also, and it is unlikely that Hevea in Malaya will prove an exception. It is not improbable that in the future daily preventive painting (especially in wet weather) will be part of the routine of every rubber plantation in Malaya, at least around the borders of plantations.

It is scarcely possible to over emphasize the damage which may be done by "black stripe," *if it be neglected*; especially in Malaya wood penetration by the disease is rapid.

It is for this reason that these notes have been published; admittedly not final, the measures set forth here have been found capable of controlling epidemics of the diseases.

In writing the above notes we have had the advantage of consulting other workers within the Department, and also Mr. H. C. Pinching, the local R. G. A. Mycologist, to whom our thanks are due.

"WATER-LOGGED BARK."

Since the above notes were written, it has been found that considerable attention is being devoted to another bark "affection" called by the Department, "water-logged bark." It is understood to correspond with the trouble known in Sumatra as "brown-bast"; and in Malaya is frequently called "claret-coloured bark canker."

This "affection" is characterized by a brownish-yellow discoloration and a sodden and water-logged appearance of the bark. It is usually only discovered when the tree stops yielding latex. If the cut be shifted latex is usually obtained, but the "affection" in most cases spreads till the entire tree may stop yielding. It usually happens that the cambium cuts off a deep-lying new bark, when the outer water-logged bark splits off in scales, and latex is for a time obtained from the new bark; this succumbs in turn. Following this, large burrs or excrescences make their appearance, and render the tree untappable.

This "affection" has been called "claret-coloured bark canker," but appears to be quite different. True "claret-bark" which is extremely rare in this country occurs as described above in very definite and clearly marked patches, surrounded by a distinct dark line; and the tissue within the patch become dark red, and collapsed and a reddish juice exudes in the later stages—borers frequently enter.

No organism, fungus or bacterium has so far been found in "water-logged bark" but evidence is accumulating that the "affection" enters by the tapping cut.

The treatment employed on many estates is that of scraping until the latex bearing layer is reached, after which a preservative —*e. g.*, 20 per cent. Brunolinum is applied. This treatment *may* be effective for young trees, where the tapping is on the virgin bark and the affected tissues seldom lie deep; or in cases where the "affection" is spotted early and only a very small area need be treated. The majority of affected trees, however, are old and in nearly all the cases the "affection" appears to be of long standing, and to be distributed over a large portion of the base. To be effective at all scraping must in such cases be so drastic that as the chances of recovery do not seem high, and considering our present ignorance of the "affection," the writer does not feel justified in recommending it. This is especially the case where further thinning out is contemplated, and the affected trees can be removed.

It is possible that light scraping—removing only the outer dead bark, and treatment with antiseptic solutions—*e.g.*, 10 per cent. Brunolinum might be useful. The writer has not yet had personal experience of the effect of this treatment (light scraping), but it is reputed to be efficacious and might be tried. The possibility of irregular renewal due to penetration of the antiseptic substance to the cambium must be borne in mind. Time alone can settle this point.

It must be understood that this negative advice is based on our ignorance of the "affection"; it is hoped that further work now in progress will lead to increased knowledge, which will justify the recommendation of curative measures.

It is said that in Sumatra daily preventive painting, as for "black stripe," has checked the spread of "water-logged bark." This might be tried if signs of spread are noticed.

[W.N.C.B.]

RUBBER AND RICE, WITH SPECIAL REFERENCE TO SILT ON PADI FIELDS.

By Cuthbert Woodville Harrison, m.c.s.

AS the staple food of a Malay population is rice those Malays who have suitable land have hitherto been accustomed to growing rice for home consumption. Rice-fields are of three kinds, namely, those depending for water on artificial storage, those which depend on rain, and those which lie in valleys on a gentle slope and draw their water from dams, upstream of the rice-fields, built on the streams draining off surrounding hills. These remarks are concerned with the last variety only. A technical description of them appears in the *Illustrated Guide to the Federated Malay States* by Mr. R. O. N. Anderson, now Director of Public Works, which includes the following remarks:

"There is a considerable acreage of land in the flat portions of the numerous valleys throughout the States planted with padi irrigated by channels constructed by the Malays themselves. They show great cleverness in locating these watercourses without the aid of any instrument. The water is usually led from a stream higher up the valley and contoured down the side of a hill, but sometimes it is brought from another watershed and it is remarkable how the people find the correct levels, apparently by intuition. It is usually necessary to construct a dam across the river, from which the water is taken, and in this work they are very expert. With no tools but an axe and a *parang* they construct excellent weirs formed from logs, brushwood and stone which last many years and hold up water to a depth of 15 feet."

The water supplied to rice-fields must be water which carries with it no contamination. Water carrying silt from a mine or chemicals from a factory is not suitable for irrigation purposes and to irrigate with a clean supply the water must be collected from a catchment area in which other interests inimical to the cultivation of the rice plant do not exist, or, if they exist, are controlled, more especially at the time of year, varying with the location, between seed time and harvest.

It may seem strange to hear the assertion that the cultivation of rubber is an interest inimical to the cultivation of the rice plant and indeed the assertion is not true at all times and in all places but it may certainly be true in places where the catchment area for the rice-fields water supply has in it rubber which is clean-weeded. We are all familiar with the cultivation of rubber. We know how the primeval jungle is first of all felled, and later burnt. That operation immediately alters the effect of the rain upon the soil. When rain has to reach the soil through jungle its drops fall first on the canopy of leaves on the tops of the trees. The force of the rain is thus broken and it has to reach the ground through obstructions such as more leaves and the branches and such undergrowth as there may be. Rain can never make a direct hit on the ground if the ground be in jungle and even when it reaches ground level it

must soak through layers of leaf-mould before it can touch the soil. But when the jungle has been burnt then the rain descends directly upon the ashes left behind by the fire. These it pounds into the ground or sweeps away in the drainage system until eventually the rain falls upon bare ground. This bare ground the rain begins to beat up into its original constituents. If these be, as so often in this country, granite detritus, then granite silt is created and this silt is carried wherever the water goes. This silt has no fertilizing value and though it is inert in the sense that it does not poison as a chemical might, nevertheless, it may mechanically injure the rice industry as follows: The water catchment area sheds its water into streams and these streams are dammed by the rice planters with dams of a very temporary nature, made of materials found on the spot. They will resist a fair pressure of water, and will even resist *spates* but they will not hold up a load of silt as well as water. Consequently where water and silt come down mixed the dams give way more readily than they would do if there were no silt, and a dam constantly attacked by silt may have to be repaired over and over again during the rice season or the irrigation supply will fail. Thus unprofitable labour is entailed and men who might be earning money at other pursuits are wasting time and effort in constantly patching up broken dams. Silt again will collect at the head of the irrigation ditch and form a bar so that water cannot get down the ditch to the rice-fields or silt will lodge all down the ditch and make it so shallow that eventually the bed of the ditch is raised above the level of the water as dictated by the dam and the water then finds its own level elsewhere and abandons the ditch. Silt will also rush down a steep ravine close to a rice-field and cover the surface of the field. If this occurs after the rice plant has been placed out in the field the plant will be smothered by the silt. If it occurs before the rice is planted then it is useless to plant on the silt because rice will not grow on granite silt. Finally silt may accumulate below a rice-field and by raising the level may prevent the water getting away. The water stagnating affords a breeding position for the insect pests of rice.

It is evident then that destruction of dams, choking of irrigation ditches, and stoppage of tail races, silting the fields, and smothering the rice plant are all possible results of clean-weeding where such clean-weeding takes place in the catchment area of an irrigation water-supply. Considerable areas may be thrown out of cultivation by silts usually at the head, the sides and the tail end of a rice valley. Such areas grow up in scrub and grass, which harbour small birds, rats and pig. These prey upon the rice grown in the centre of the valley.

Enough has probably been said to show that clean-weeding silt from rubber estates is a real danger to the cultivation of rice and—particularly just now when the world's grain supply is being steadily diminished by the great war—the question arises—is one cultivation justified in inflicting such injuries upon another cultivation? This question is followed by another. Can the one cultivation compensate the other for such injury? The third question is—can the one cultivation amend its ways so as to cease the infliction of this injury? The second is readily answered and the answer is, No. Nowadays no money can compensate the world

for the loss of food. The cases in which it is proper to say to the rice cultivator "take this money from the rubber cultivator, abandon this your rice-field and with this money open a new rice-field in some protected area" are very few. They exist, but they are few and the areas which might reasonably, even in time of war, so be treated are small areas, very small areas, areas so hopelessly surrounded by so steep lands so entirely under rubber that the case is beyond remedy. We return then to the first question—is one cultivation justified in inflicting such injuries upon another cultivation? This question has a legal aspect and a moral aspect. We will take the legal aspect first. It is crystallized in the legal maxim "You may only use your own property in such a way that you do not damage other people's property," of which the colloquial rendering is "Live and let live." No man has the right to allow clean-weeding silt to mix with water on his estate and to run it off his estate on to some other man's property or into some other man's irrigation works. The fact if alleged in defence that to be bound by this would be to forego clean-weeded cultivation is no answer. The obligation is absolute. In law every rice cultivator whose interests are damaged by silt has a good case against the rubber planter who runs that silt on to him. That is, he has a good case until the rubber planter's advocate produces a better one. As to the moral aspect of the question—no cultivator is morally justified in thus injuring another cultivator. So to injure another is morally wrong. Remains then the third question—can the one cultivation amend its ways so as to cease the infliction of this injury on the other?

This question is the most practical or interesting of the three and it is much to be regretted that there is no satisfactory answer yet found. Expert irrigation engineering opinion is that unless a satisfactory answer is found there will go out of cultivation in the course of years and in certain places very many acres on which rice is now grown. The soil will be degraded and degraded and degraded off the hills round the rice valleys and the silt will form a flood plain spreading and spreading and spreading over what is now rice-fields. No rice-fields will survive except those in whose catchment areas there is no clean-weeding. The present rice-fields of the class of which this paper treats have met an enemy interest which has so far been too strong for them. Enumerating the possible remedies we can think of:

(*a*) Ceasing to clean-weed;

(*b*) Hoping that when the rubber is fully grown the silt from beneath the trees will not be so heavy as it is off young rubber plantations because the impact of the rain will not be directly on to the soil;

(*c*) Believing that the top soil will harden at last and refuse to be beaten into silt by the rain;

(*d*) Planting bamboo hedges in ravines to filter the water carrying silt;

(*e*) Allowing ravines and all places where water drains off clean-weeded areas to grow up into grass or scrub which would filter the silt out of the water;

(*f*) Building dams against silt;

(*g*) Digging silt annually out of ditches and from behind dams during the padi season;

(*h*) Providing special channels for silt in cases where there are but a few silt producers in a catchment area;

(*i*) Making use of pipes or flumes to bring in siltless water from catchment areas still in jungle;

(*j*) Digging on slopes long catch-pits across the trend of the water so that it may drop its silt before it reaches a ravine leading to a rice-field or irrigation ditch.

To select the most practicable amongst these remedies is difficult. All may be all nonsense, or some may be possible in one place and others in another place. Moreover, there may be many other and better remedies. Perhaps these remarks will evoke them. Anyhow it surely should not be beyond the wit of man in this country to run these two cultivations side by side. What may be called the desperation policy is to say "Let the existing rice-fields threatened by silt give up the struggle and let us in future see to it that whole catchment areas are devoted to rice alone." That shelves the present awkwardness very nicely but it acquiesces in a wrong and might well leave a sense of injury or allow to grow stronger a feeling of antagonism, at present not very acute, between the two cultivations. The rubber cultivator is probably quite ready to acknowledge his fault and to amend if any one will show him how to amend but so far no one has shown him and the instances in which he has himself tried to amend have been few. In days such as ours with estates going shorthanded it is difficult for the rubber planter to remember that his rice planter neighbour should be loved by him as he loves himself and even when he remembers it is difficult to act on such lines. But an obligation exists. It is an obligation of a rich man to a poor man, of a raw material producer to a food producer, and it should be redeemed. The redemption of that obligation is an ingenuity problem as well as a financial problem and as a problem is not unworthy of the attention of the best wits amongst us.

THE LEMON-SCENTED GUM.

(*Eucalyptus citriodora*).

By J. N. Milsum.

REFERENCE was made in a previous publication of the Department of Agriculture * to two Eucalypts thought to be *Eucalyptus citriodora*, growing in the Experimental Plantation, Kuala Lumpur. During the latter part of May of this year these two trees were observed to be flowering and continued so for the following three months. As previously stated some uncertainty then existed as to whether these trees were *E. citriodora*, Hook., it being thought possible that they might belong to the allied genus *Backhousia*. It can now, however, be stated with certainty that these trees are *E. citriodora*, the flowers entirely agreeing with the description afforded the species, noticeably in them being superiorly truncate entire whereas the genus *Backhousia* has flowers the sepals of which become large and more or less petaloid. The appearance of these trees would seem to indicate that *E. citriodora* might be an introduction of some value. Recent measurements show that they have attained a height of 45 feet in three years from sowing of seed. The trees also appear to be quite healthy and growing vigorously.

Several young trees of this species raised from seed in January, 1916, in the Public Gardens, Kuala Lumpur, and planted out in August of the same year, are growing well and give promise of becoming large specimens. The following table shows the rate of growth of these trees. The Garden number is appended for reference.

Garden No.	Name.	Date planted.	Height, November, 1916.		Height, August, 1917.	
			ft.	ins.	ft.	ins.
4	*Eucalyptus citriodora* ...	August, 1916	5	6	15	0
5	„ ...	„	7	9	19	0
10	„ ...	October, 1916	5	3	18	0

In each instance a fine clean trunk is being formed, the smooth, white bark making the tree a conspicuous object. The branchlets are long and slender with a drooping appearance. The leaves are narrow, light green in colour and when rubbed emit a strongly lemon-scented odour. The creamy white flowers are small and numerous.

E. citriodora is said to reach a height of 125 feet and a diameter of 4 feet. The timber is flexible, strong and durable.

* *Agricultural Bulletin, F.M.S.*, Vol. V, No. 2, p. 47.

It is used in coach building and for other uses such as poles and girders. The leaves produce a volatile oil used in perfumery. The tree possesses the desirable feature of being very ornamental which, combined with its odorous leaves, makes it a very pleasing tree for the garden. As to whether it would produce timber of sufficient value to repay for its cultivation in this country remains to be seen, it would appear, however, to be the most suitable species for growing on the plains. A further point in its favour is the ease with which it may be raised from seed. On several occasions seed has been imported from Australia and India and in each case germination has been satisfactory. Seedlings when once established grow rapidly and are frequently ready for planting out within six months from sowing of seed.

CLEAN WEEDING ON COCONUT ESTATES.

THE deleterious effect of grass on the growth and fruiting of "fruit trees" has been definitely proved in England by the researches of the Duke of Bedford and R. U. Pickering whose conclusions on the results of 16 years work is summarized in the 13th Report of the Experimental Fruit Farm at Woburn. The main conclusions arrived at in this report may be summarized as follows:

*"(1) The effect of grass on fruit trees is often so deleterious that all growth is prevented, and the trees are frequently killed outright.

"(2) Recovery of health by the trees has only occurred in cases where the roots could extend beyond the grassed area.

"(3) If ground hitherto tilled is allowed gradually to grass over the effects on the trees are less prejudicial than if grass seed is deliberately sowed.

"(4) Trees that had grown four years on grass-free ground suffered at once when grass was sown or allowed to establish itself and a similar though slower result was obtained with trees that had been growing on tilled soil for 12 years.

"(5) Certain varieties of apples, being more vigorous, suffer less than others.

"(6) The stock, whether paradise or 'free,' has but little influence.

"(7) Pears, plums, and cherries were affected nearly to the same extent as apples, but, in the case of these trees, standards suffered less than dwarfs.

"(8) If a tree is growing too vigorously, grassing up to within five or six feet of the stem was found to check growth and encourage fruiting.

"(9) Grassing tends to produce fruit of a high colour.

"(10) Where a circle, say three or four feet in diameter, is kept free from grass round the base of a young tree, the tree is benefited, but directly even a few of the roots extend into the adjoining grass area the pernicious effect on the growth of the tree is observable.

"(11) Forest trees were affected in the same way as fruit trees when grass was sown immediately after planting, but on light soil conifers were affected much less than fruit trees, and some recovery occurred as time went on, whereas in the case of fruit trees, the effect was intensified by time.

"(12) Eighteen different species of grass were tried and all were found to restrict growth, though the stronger grasses were more prejudicial than the less vigorous species.

"(13) Clovers also restricted growth, but the yellow colour of the foliage of the fruit trees, which is so characteristic when grass is used, was absent under the influence of clover.

"(14) The injurious effect of grass was proved not to be due to (*a*) interference with the circulation of atmospheric air in the soil;

* *Indian Forester*, Vol. XLIII, No. 2, 1917, p. 95.

(*b*) the amount of carbonic acid gas in the soil; (*c*) soil temperature; (*d*) food supply; (*e*) physical condition of the soil; or (*f*) the micro-flora of the soil.

"(15) The deleterious effect of grass was found to be due to a substance produced by the grass roots, which acts as a poison to the roots of fruit and most other trees. The evidence on which this conclusion is based seems quite decisive, but it is too long to be produced here. The toxic substance is easily destroyed by contact with air, and this accounts for the fact that while fruit trees may make little growth if planted in an old pasture, the turf of that same pasture will greatly stimulate growth if it is made into a heap and occasionally turned over to promote decomposition."

Hitherto the question of the advisability of allowing grass-weeding as compared with clean-weeding on coconut estates has been decided chiefly on questions of weeding costs, though anti-grass-weeders have produced what have been plausible arguments against it, such as that of the creation, by grass-weeding, of a tight surface soil where æration is at a minimum, where the constant respiration of a close mat of grass roots produces a narcotic effect on the developing roots of the palms, and where micro-organic action particularly of the beneficial nitrifying nature has been suppressed by the increasing acidity. These arguments it appears may be dispelled for Home conditions in the light of the conclusions enumerated under (14) but it remains to be proved that the toxic effect demonstrated as being of so pernicious nature to apple, pear, peach and ash in England does not hold for coconuts in this country. The question of toxic excretions of one species of plants killing out others is comparatively new: work has been done in America[1] and India[2] supporting in the main the conclusions arrived at in England—and it seems a fruitful piece of research to investigate the same on the growth of this important crop in this country. This should not be a difficult matter. One method of investigating the same would be by taking series of young palms on a series of soil types of the heavy clays, loams, and *permatang* natures, and instituting a series of growth records under different treatments. The records should include in the first instance observations over all the palms for a period to be decided on as the experiment matured, on bole-diameter at a given height, on height of trunk, on the number of fronds produced per arbitrarily fixed time and on other comparable data including the number of spikes produced in equal periods of time, on the average length of the rachis, on the lengths and breadths of the pinnæ and other points which would suggest themselves as the experiment developed, and these should be carried on with palms under different treatments. These records would in the light of the records obtained on untreated palms, provide a more reliable index of the effect of treatment than the taking of yields from the palms, since these are so bound up with the disturbing factors of pollination and fertilization, and on them the writer believes that more information of utility respecting the use of covers could be obtained than by the expensive method of laying out large blocks of land to the same.

G. E. C.

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[1] Schiemer and Reed. *Bureau of Soils, U.S.A., Bulletin* 40.

[2] Fletcher. *Agricultural Journal of India*, April, 1908.

RUBBER NOTES.

A Giant Hevea Tree.

IN the *India Rubber World*, Vol. LV, No. 4, January, 1917, the following particulars are given of a big Hevea tree in South America, stated by the writer to be probably the largest in the world. This tree is 127 feet in circumference at the base and has a record of yielding for 120 days at the average of 22 pounds of rubber per day. The tree is situated in Brazil and is exploited by a whole family—father, mother and several children—which divides its time between cultivating cereals for food and extraction of the latex from this tree. It is said not to be the only giant tree in the region, in fact there are thousands, but this is the largest being tapped.

The land in the district is considerably higher than the surrounding land and the writer concludes that it was from the seeds of these trees that the Hevea found its way east and south of Brazil, since native Hevea is found as far south as the 17th degree. The writer expresses the opinion that this tree must have been growing long before Columbus visited America.

Improved Packing of Plantation Rubber.

The following suggestions on methods of packing plantation rubber have been obtained by the Rubber Club of America from sixty leading rubber manufacturers and are published in the *India Rubber World*, Vol. LV, No. 4, January, 1917.

1. A heavy paper should be placed inside the boxes.

2. Rubber should be packed in muslin or sheeting bags inside the boxes.

3. Boxes should be made to hold 200-300 lbs. to lessen handling.

4. Boxes should be capable of being taken to pieces and reassembled without the removal of binding iron and nails.

5. Boxes should be lined with tin and made stronger.

6. One grade of rubber only should be placed in a case and the top layers should not be of better quality than the layers beneath.

7. A standard for the various grades should be fixed by the Rubber Club in connection with the Rubber Importers' Association.

8. A case should be devised with a lid which can be opened for inspection, to avoid splitting the cases, and provided with a fastening which would withstand shipping.

9. Interior finish of cases should be smooth and joints made closer.

10. Soapstone should be placed between the sheets of rubber to avoid moisture from sweating.

11. Hardwood cases should be used.

12. Great care should be taken in coopering packages.

13. Rubber should be baled and burlapped.

14. The present Momi cases should be fastened securely round both edges and round the middle, both endwise and crosswise, with metal strapping.

15. In the case of Venesta chests, metal straps round the edges should be united instead of rivetted.

16. Less rubber should be packed in cases.

17. Jelutong and Seraya wood boxes should be used.

18. Larger cases, divided into compartments, should be used to avoid the rubber shaking down to one end during transport.

19. A rapidly revolving iron brush be applied to the interior of the box on a suitable vacuum cleaning nozzle.

20. Wider box strapping be used and more care taken as to the placing of nails.

21. More care be taken in placing on the cases the inscription "Stow away from boiler."

22. Greater care in loading and unloading and less handling in the warehouse.

23. Rubber should be packed dry and not damp, causing a shrinkage above the 2 per cent. allowed by sellers.

Several of the above suggestions appear to be quite useful, especially those dealing with the interior lining of cases and the method of closing cases, so that they can be opened easily for inspection.

In Singapore, the writer observed that native and other rubber purchased by American buyers was all converted to blanket crêpe in a factory belonging to the buyer in Singapore and the rubber was packed in larger and much stronger boxes of Seraya or Meranti wood, lined with a kind of thin muslin or cambric, similar to that used for packing butter.

Re cases, it would certainly seem possible and desirable to employ, say, somewhat longer and stronger cases with lids, which were not rivetted or nailed down. Some kind of strong clamp to fit round the box and capable of being opened easily, so that the rubber could be inspected or removed without breaking up the boxes would meet the case. If a box of this kind were devised, the original higher cost would be compensated for by the fact that the cases could be used many times, although of course the question of returning the boxes would have to be considered.

B. J. E.

SUMMARY OF LOCUST WORK FOR THE 4th QUARTER, 1916.

By F. W. South.

THE period of destruction work which commenced early in July and continued throughout the third quarter was only concluded in the Negri Sembilan, Pahang, Malacca and Johore towards the end of October. Early in November hoppers reappeared in the Tampin district of the Negri Sembilan, in the Southern district of Malacca and in various places in Northern Johore. The work of destruction had not been entirely concluded at the end of the year in any of these places. There was, however, considerable probability that all the hoppers would be successfully destroyed and the number of flying swarms known to exist was not very large.

Selangor.

During this quarter the four older swarms of flying locusts gradually disappeared, and the insects, after having apparently lived for an abnormally long period, died without laying eggs. There remained only the swarm in the neighbourhood of Sepang, but, although this was reported to have copulated in October, no breeding grounds nor any hoppers were found. As only this one swarm remained and as the insects did not appear to be capable of reproduction the conductor and all the scouts were transferred or dismissed at the close of the year.

Negri Sembilan.

The long third season of destruction work was brought to a successful termination in the Tampin, Kuala Pilah and Jelebu districts during October. The localities where work was done being Batang Malaka, Inas, Kuala Pilah and Kuala Klawang. The only escapes in the Jelebu district were a small swarm of young fliers which survived only to be destroyed by the Malays who caught the mature insects at night. On the completion of the work two flying swarms were reported, one at the 46th mile on the Kuala Jelei road and one at Bahau. There were no locusts found elsewhere in the State. By the end of the month the number of flying swarms had increased to six, since four swarms had appeared along the Malacca boundary at Keru, Regent Estate, Batang Malaka, near the station, and at Ayer Kuning.

Early in November these swarms were located at Kuala Pilah, See Kee, Inas, Batang Malaka, Gemencheh and Ayer Kuning. The swarm at Inas commenced to lay on 3rd November and continued to do so until the end of the month. The Ayer Kuning swarm was laying eggs near the station on 10th November and the Batang Malaka swarm also layed about this time. Hoppers believed to be the offspring of an unreported swarm from Malacca were found midway between Batang Malaka and Ayer Kuning on 10th November. Destruction work started at Ayer Kuning on the 15th and at Inas and Batang Malaka on the 23rd and 24th, respectively.

On 8th November a large swarm of fliers was reported at Kuala Jelei and this subsequently moved to Kopis where it was joined by the swarm from See Kee. The Kuala Pilah swarm moved to Kuala Jelei and there were two swarms reported to be at Gemencheh. Of these four, three swarms were laying, while one, the Kuala Jelei swarm had already layed its eggs.

During December the Kuala Jelei swarm broke up and disappeared apparently without producing any offspring unless these were scattered in small numbers through the lalang and were undiscoverable. On 2nd December hoppers appeared at Mowlan, Selaru and near See Kee which were the offspring of the See Kee portion of the Kopis swarm. This swarm, consisting of insects of different ages, flew down to Lunding and laid most of its eggs there. The swarms at Gemencheh laid and the destruction of the hoppers was commenced during the first half of the month. Thus destruction work was in progress at Ayer Kuning, Batang Malaka, Gemencheh, Mowlan, Selaru and Inas during the month. The work at Inas was finished on the 19th, but in the other centres it was expected to continue until the middle of January. There was work expected in January at Lunding and also at Johol where a part of the migrating Kopis swarm which stopped at Inas eventually laid. There were flying swarms at Pondoi near Keru which were expected to produce offspring early in January.

On 14th, 15th and 16th December, the Assistant Agricultural Inspector visited the Ulu Gemas country again and found several not very large scattered swarms of hoppers and fliers; one large swarm of fliers in the Johore portion of this country was said to have flown into Malacca a week previously. The reduction of the work in other parts of the Negri Sembilan will, it is hoped, allow this district to be well searched and thoroughly freed of locusts in the coming year.

There were no locusts in the Seremban or Coast districts during the quarter. The total number of swarms destroyed in the Negri Sembilan during the quarter was 719.

Pahang.

The destruction work started in September continued at Triang and Mengkarak until 20th October when all the hoppers were believed to have been destroyed after a careful search for scattered swarms had been made. However, a small flying swarm was said to have been seen near Mengkarak in November and this was found in December and destroyed by a mandor and a few coolies who burnt the flying insects at night. So far as was known Pahang was free from locusts at the end of the year. In this State 158 swarms were poisoned.

Malacca.

The destruction work of the third quarter was continued into October and was not concluded as early as was expected owing to the discovery of new breeding grounds at Bukit Senggeh, Jus, Tebong, Keru, Malaka Pindah, Tangga Batu, Tanjong Minyak and Sungei Udang early in October. As a result the work was carried on in all

three districts until 31st October when it was finally completed for the season. During this long period the only escapes were one swarm at Ayer Molek in August and a few small swarms at Gadek and Sungei Baru in October. During the month several flying swarms came in from Johore, especially near Bekoh and Assahan and one came from the Negri Sembilan near Nyalas. It seems probable that these swarms or some of them originated in the Ulu Gemas. An exact record of their number was rendered impossible owing to their crossing and recrossing the boundaries so frequently. At least two swarms laid eggs towards the end of the month at Nyalas, Chohong, Chabau and Diamond Jubilee Estate and there were four more in the Southern district about to lay. There were also swarms at Kendong, Bukit Rambai, Sungei Udang and Gadek; the insects composing these were young.

Hoppers hatched out at Nyalas and Chohong on 1st November and at Diamond Jubilee Estate, Chin Chin, Chabau, Jasin Estate and Ayer Panas Estate a few days later. Work was commenced again on 7th November and at the end of the month was in full progress practically throughout the Southern district as several further breeding grounds were found, of which two were at Sungei Rambai. A peculiarity of this generation was that the breeding grounds were usually very small and scattered and a swarm of fliers was noticed laying in as many as a dozen places throughout a fortnight. This renders the hoppers of various ages and mixed instars. It does not assist the work, as it much increases the distances to be covered and multiplies the labour of transporting, putting up and taking down the apparatus.

At the end of the month there were five known flying swarms at Batang Malaka, Kesang, Bukit Rambai, Sungei Udang and Lanchang, respectively. That at Batang Malaka may have been the same as one reported by the Assistant Agricultural Inspector, Negri Sembilan.

The destruction work continued throughout the Southern district until the close of the year when the generation of hoppers was almost completely destroyed, though work had not entirely stopped. Three other swarms of hoppers had, however, laid before the conclusion of the work at Tebong, Sungei Rambai and Kemankan (Ayer Panas), respectively.

The Northern and Central districts were free from hoppers, but two or three flying swarms were present. Flying swarms were also present on the boundaries of the Negri Sembilan and Johore, but a marked diminution was observed in their size and numbers.

In all, 1,788 swarms were destroyed during the quarter and the number of locusts in Malacca was materially reduced, in spite of a considerable influx of flying swarms from outside the Territory. Labour still presents difficulties and in many cases gangs had to work overtime in order to complete the work as so few coolies have been obtainable. A total of 817 gangs worked during the quarter containing 9,044 coolies. The maximum number of gangs employed on any one day was 16 and the average number each day, was between nine and ten.

JOHORE.

The destruction work around Batu Anam, commenced in the previous month, was continued until 21st October. There were no hoppers present elsewhere in October. Hoppers again reappeared during November in all the different centres and there was destruction work in them all during November and December. By the end of the year this was concluded everywhere except around Tangkak, but flying swarms were present in all the districts and work was expected to commence again during the first quarter of the new year. There should not be any difficulty in destroying all the hoppers expected during the coming season, with the possible exception of those hatched out in remote places as it is difficult to obtain information of the presence of these. In all, 989 swarms of hoppers were destroyed during the last quarter of 1916 in Johore, of which, 874 were poisoned and 115 were trapped.

Tangkak.—The few flying swarms which escaped the destruction work of the previous season in this district were joined by others from some unknown locality outside during October; the total number of flying swarms could not be determined as they moved so frequently from place to place. On the 30th and 31st hoppers were reported near Bekok, at Sebrang Gajah and at Chenas.

Destruction work was started near Bekok on 2nd November. The gang moved on the 10th to Sebrang Gajah working at various places from Sialang to the boundary until the end of the month, when the remaining hoppers had only reached the 3rd instar. It was noticed in this locality that fresh swarms of hoppers kept reappearing in areas where work had already been done.

On the 16th a driving gang of eight or nine coolies was started near the 18th mile and continued working until the end of the month at various places between the 18th mile and the Malacca boundary they then stopped work as the coolies were wanted in the spraying gang to which four sprayers had been added. There were a few scattered small swarms of hoppers near Tangkak at the close of November—namely, at Anjong Batu, Padang Lalang and Bukit China. There were no hoppers at Sagil, Blemang or Ayer Panas, but a number of flying swarms which had not yet laid had appeared in these places from outside. There were also fliers at places around Bekok.

By 15th December the November generation of hoppers had all been destroyed, work having been carried on at Belading, Batu 12, Anjong Batu and Bukit Banjar. Hoppers, however, again hatched out at Paya Mas and Sagil and soon afterwards at Ayer Batu and Sulok near the Tangkak village padi-fields. The spraying gang worked at Sagil from the 16th until the end of the month and a driving gang worked for the same period at Paya Mas as spraying was dangerous to the estate cattle.

If necessary, the spraying gang from Sagil, when the work there is completed, will be allowed to work at Paya Mas and the driving gang will work near the padi-fields where spraying is impossible. Some newly hatched hoppers at Bekok will also receive attention.

There seems to be little doubt that several of the flying swarms which continually enter this district come from the large stretch of lalang country behind Mount Ophir. From the neighbourhood of Tangkak these swarms spread to those other centres where work has usually been carried on in Northern Johore.

Sungei Mati.—There was no destruction work in this district in October. The two flying swarms reported as present during September split up into a number of smaller swarms and scattered to various places during the month. Two new swarms entered the district, one from Ulu Grisek and one from Tangkak. On 24th October these two swarms with one from Serom collected at the 9th mile, Tangkak road, and then split up into a number of small swarms which scattered everywhere.

One large flying swarm left the region of the Kesang river about the middle of the month and crossed the Muar river on the 31st arriving in Bandar Maharani. The fliers which crossed the Kesang from Malacca in September settled along the river from Kesang to Sungei Palong and laid eggs at Londang Pallas and Kesang Tasi. Breeding grounds were also found at the end of the month along the Tangkak road from the 9th to the 14th miles.

Destruction work commenced on 4th November and the gang worked back gradually from the 13th mile to Sungei Mati. On the 25th, the gang moved to the Kesang river where they worked until the end of the month. There were hoppers at Merbau Bedarah and Parit Bunga which remained to be dealt with.

In December, these hoppers were destroyed as well as swarms at Plampong, Glogoh and at the 11th and 12th miles, these latter being discovered during the month. The work was concluded on 31st December and all the hoppers were believed to have been destroyed. Fliers were reported at Bukit Tanjong Selabok, having crossed the river from Bukit Pasir. This swarm had not laid. There was also a swarm at Pengkalan Kundang which had laid; the laying grounds had been found, so that work will be in progress there early next year.

Labour gave much trouble in this district during this quarter except at Merbau Bedarah. Kampong Malays will sometimes work in their own kampongs, but not elsewhere. A permanent gang of coolies cannot be kept together, partly because the work is not continuous, but mainly because of the high prices paid for tapping rubber trees. Coolies had actually to be collected singly from Malacca. There was some opposition to spraying at Glogoh on the part of the Kampong Malays, but this was overcome with the aid of the penghulu.

Muar.—There were no hoppers in this district during October, but fliers were known at "Serang Buaya Ulu" and Ladang Ubi, a large lalang stretch about half way between the end of the railway line and Batu Pahat; there were several swarms there. Other smaller flying swarms were known at Parit Sri Menanti, Parit Pechah and Sungei Pulai near the end of the railway. A few small flying swarms were present in the Bukit Pasir neighbourhood, these originally came from Serom.

On 31st October, a large swarm of young fliers crossed the river, as all ready reported from Tanjong Agas to Bandar Maharani, it came from the Kesang river. It stayed two days in the town and then moved to a place near the sea three miles distant, after which it disappeared entirely and was believed to have been blown out to sea by the strong land breeze then prevailing.

A few swarms of hoppers appeared around Bandar Maharani in November but these were easily destroyed between the 23rd and 29th of the month. The fliers present at Bukit Pasir in October went to Ladang Ubi; all the insects in this area were young and had not laid eggs. There were also flying swarms at Sungei Balang and at Modo and Sungei Trap near the Muar river.

In December hoppers again appeared in the town at the Tanjong and Barracks but these were disposed of by a driving and a poisoning gang, each of which worked for two days. A new large swarm of young fliers was reported and found at a place five miles through the jungle from the end of the Jalan Bakri. This swarm was the offspring of a swarm which arrived there five months previously and had bred without being discovered. A few swarms of fliers remained near the end of the railway line and at Bukit Pasir. There was, therefore, reason to expect more destruction work in the first quarter of the new year.

Muar River, Panchor.—There were two flying swarms in this neighbourhood in September and these laid eggs in October. When the hoppers hatched out they were at first confined to clean-weeded areas of Nordanal Estate and so could not be poisoned. A driving gang was started on the 29th and poison work was commenced as soon as the insects reached the grass of the kampongs. They were all destroyed by 12th November.

There was a flying swarm at Pengkalan Bukit, but no breeding grounds or hoppers from it were found in October nor were reported subsequently. During November and December there was only one flying swarm in this district; this moved about between Bukit Kepong and Jementah. All other parts were free from locusts.

Batu Anam.—The work of destroying hoppers along the Jementah road commenced in September continued until 21st October. On 3rd October 24 additional sprayers were loaned from Tampin and extra coolies were obtained. By means of overtime work in the afternoons all these hoppers were destroyed and none escaped as was anticipated in September.

The hoppers at Buloh Kasap and Segamat escaped and part of the swarm went as far south as Genuang. A new swarm of fliers arrived on the Jementah road from the country between Jementah and Kabun Bahru which is some distance from either Batu Anam or Tangkak.

Towards the end of the month laying grounds were found at Spening near Buloh Kasap and hoppers appeared on 11th November work starting on the 13th. On the 23rd November hoppers were found at Tasek and Pogoh near Segamat and work commenced on the 26th and others were also found at Genuang and Tenang. The

coolies said that hoppers had been present three times at Tasek and Pogoh during 1915 and the Penghulu admitted that he did not report them for fear that the cattle and goats should be poisoned. The hoppers at Tasek were all destroyed by 15th December and the gang then joined that at Pogoh. Work at the latter place and at Spening was finished at the end of the year and all the hoppers were destroyed. During December the hoppers at Genuang and Tenang were all burnt by local Malays and Tamils working on the railway line.

In November hoppers were also reported at Ulu Segamat three days' journey up river, but nothing could then be done with these. Fliers during this month were reported as far south as Bekok and Nior and a few were found at Ulu Palong and Tambak. The flying swarm which came from Kabun Bahru to the Jementah road in October went back in November towards Malacca. In December fliers were found at Bekok and Paloh but none were further south at Kluang or Nior. There were fliers also at Tebing Tinggi near the Muar river about half way from Buloh Kasap on the railway to Bukit Kepong. These were escapes from hoppers present in December. No other flying swarms were known for certain, but there was a rumour of others at Rengam. This report will be enquired into early in January. At the conclusion of the work the sprayers borrowed from Tampin were all returned.

On the whole the number of locusts present in Johore has been considerably reduced during the year and the offspring of the swarms now known should be successfully destroyed during the next season's work. Provided new swarms do not enter in large numbers there should not be a very large amount of work necessary in 1917. The occurrence, however, of wide lalang patches in remote and inaccessible places renders the work in Johore more difficult and more uncertain than it is in other parts of the Peninsula.

Conclusion.

The locust work in the Peninsula throughout the year may be considered to have been quite successful. There was an unexpectedly large generation of hoppers from March to May probably the offspring of unknown swarms from remote places such as the Ulu Gemas. An even larger generation or succession of generations followed from July to the end of October. This was not unexpected as it was known that some swarms had bred without being discovered and numerous flying swarms were present during June, while the weather conditions favoured the insects. At the end of the year, however, there was a generation considerably smaller in size, as only a few swarms escaped in the middle of the year and there was every prospect that all the known swarms of hoppers would be easily destroyed at least in the Negri Sembilan and Malacca by about the end of January. In all, 2,911 swarms were destroyed in the Negri Sembilan; 158 in Pahang; 4,952 in Malacca; and 1,877 in Johore during the year. The position appears to be favourable for 1917, especially as most of the remote possible breeding grounds are known; the experience of last year shows, however, that it is unwise to make any definite forecast of the results that may be expected from the work in the coming year.

Table of Results, 4th Quarter, 1916.

State.	District.	Locality.	Date.	Swarms Driven.	Tins.	Swarms poisoned.	Total Swarms.	State Total.
Negri Sembilan	Tampin, Kuala Pilah and Jelebu	Batang Malaka ...	1st to 7th October ...	...	...	24	24	
		Inas	1st to 17th „	...	...	45	45	
		Kuala Pilah ...	1st to 22nd „	2	...	52	54	
		Jelebu	1st to 16th „	...	...	35	35	
			Totals ...	2	...	156	158	158
Negri Sembilan ...	Tampin and Kuala Pilah ...	Batang Malaka and Gemencheh	24th November to 31st December ...	Work not finished		211	211	
		Ayer Kuning ...	15th November to 31st December ...	„	„	196	196	
		Inas	23rd November to 19th December ...	...	...	62	62	
		Ulu Mowlan ...	11th to 31st December ...	Work	finished	71	71	
		Selaru	23rd to 31st „ ...	Work not	finished	21	21	
			Totals ...	...	...	561	561	561
			Totals for the quarter ...	2	...	717	719	719
Pahang ...	Temerloh	Triang	1st to 20th October ...	...	...	91	91	91
Malacca ...	Southern ...	Batang Malaka ...	1st to 31st October ...	606	...	...	606	606
		Jus						
		Bukit Senggeh ...						
		Tebong						
		Keru						
		Gadek						
	Northern ...	Lendu						
		Parit Bala ...						
		Malaka Pindah ...						
	Central	Tanjong Minyak ...						
		Tangga Batu ...						
		Sungei Udang ...						

Malacca ...	Southern ...	Ayer Panas ...	7th November to 31st December ...	1,182	Work not	finished	1,182	1,182
		Jasin						
		Diamond Jubilee						
		Chin Chin ...						
		Chohong						
		Selandar						
		Nyalas						
		Chabau						
		Mariang						
		Chindara						
		Sungei Rambai ...						
		Sebatu						
		Merliman						
			Totals for Quarter ...	1,788	...	...	1,788	1,788
Johore ...	Batu Anam ...	...	1st to 21st October ...	...	...	119	119	119
Johore ...	Tangkak	...	2nd November to 31st December ...	99	213	139	238	Work not finished
	Sungei Mati ...	...	4th November to 31st December ...	...	...	118	118	
	Muar	Bandar Maharani	23rd to 29th November a few days in December...	2	10	18	20	
	Muar River ...	Panchor	29th October to 12th November	14	20	30	44	
	Batu Anam ...	Spening	13th November to 31st December	...	...	186	186	
		Tasek	26th November to 15th December	..	...	73	73	
		Pogoh	26th November to 31st December	...	...	191	191	
			Totals ...	115	243	755	870	870
			Totals for the Quarter...	115	243	874	...	989

Table of Results in 1916.

State.	District.	Dates.	Swarms Driven.	Tins.	Swarms Poisoned.	Total Swarms.	State Total.
Negri Sembilan	Tampin and Kuala Pilah	20th March to 30th May	...	...	1,110	1,110	1,110
	Tampin	19th July to 22nd October	...	...	757	757	
	Kuala Pilah		10	...	401	411	
	Jelebu		...	...	72	72	1,240
	Tampin	15th November to 31st December	...	...	561	561	* 561
		Totals 1916	10	...	2,901	2,911	2,911
Pahang	Temerloh	11th Sept. to 20th October	...	...	158	158	158
Malacca	Southern, Northern	24th March to 7th May	739	...	...	739	739
	Southern, Central, Northern	2nd July to 31st October	3,031	...	...	3,031	3,031
	Southern	7th Nov. to 31st December	1,182	...	...	1,182	* 1,182
		Totals 1916	4,952	...	...	4,952	4,952
Johore	Batu Anam	1st to 7th January	...	...	21	21	21
	Tangkak	7th March to 13th May	42	206	102	144	
	Sungei Mati		...	...	78	78	
	Muar River		...	...	72	72	294
	Tangkak	28th June to 16th Sept.	...	...	144	144	
	Sungei Mati		...	...	92	92	
	Muar River		...	...	160	160	
	Bandar Maharani	10th Sept. to 21st October	63	120	33	96	
	Batu Anam		...	...	200	200	692
	Tangkak	29th Oct. to 31st December	99	213	139	238 *	
	Sungei Mati		...	...	118	118	
	Muar River		14	20	30	44	
	Bandar Maharani		2	10	18	20	
	Batu Anam		...	...	450	450	870
		Totals 1916	220	569	1,657	1,877	1,877

* Work not finished.

REVIEW.

A Practical Guide to Coconut Planting.

By R. W. Munro and L. C. Brown.

Published by Bale, Sons & Danielson, Ltd.

THE coconut industry in this country is still in its infancy yet enough has been done by the few pioneers to form a working basis for others.

The results of the collaboration of Messrs. Munro and Brown have been eagerly anticipated and in the volume appearing under their names is to be found a large amount of very useful matter embodying considered opinions on the results of many years' experience with the crop.

A pleasing feature of the book is its wealth of illustrations, but some of them are we think inadequately described. An additional recommendation of the book in its utility to agents and planters, is that scientific terms are conspicuously absent.

The one major criticism which seems important is that as a "guide" it deals in too little detail with the many points which should be analysed in arriving at the cost of "bringing into bearing" and the cost of production. This, we hope, may be rectified in any future edition.

G. E. C.

NOTE.

The Director of Agriculture invites communication from planters whose estates contain small and well-defined areas, belts or patches on which the growth of the trees is markedly inferior to that of the rest of the field.

Several such cases have recently engaged the attention of the Department.

There are indications that "bad patches" may be traceable to soil differences and the chemical division wishes to investigate as many cases as possible.

TABLE I.

Agricultural Acreages, Federated Malay States, 1915 and 1916, excluding Padi and Horticulture from Estates over 100 acres in extent.

	Selangor.		Perak.		Negri Sembilan.		Pahang.		Total.	
	1915.	1916.	1915.	1916.	1915.	1916.	1915.	1916.	1915.	1916.
Coconuts	21,352	22,511	29,495	30,531	1,483	1,935	2,492	2,587	54,822	57,564
Rubber	211,704	229,091	166,248	191,329	109,723	119,150	11,804	12,389	499,479	551,959
Coffee	3,656	1,788	632	757	9	9	15	...	4,312	2,554
Other cultivations	780	1,767	238	1,780	211	2,574	5	10	1,234	6,131
Total ...	237,492	255,157	196,613	224,397	111,426	123,668	14,316	14,986	559,847	618,208

TABLE II.

Agricultural Acreages, Malaya, 1916, from Estates over 100 acres in extent.

	Federated Malay States.	Johore.	Kelantan and Kedah.	Trengganu.	Grand Total.
Rubber alone	543,729	148,169	90,430	2,645	784,973
„ and Coffee	1,137	5	...	...	1,142
„ „ Coconuts	2,249	45	1,355	...	3,649
„ with other crops	4,844	5,472	6,651	...	16,967
Total ...	551,959	153,691	98,436	2,645	806,731
Coconuts alone	53,729	2,072	7,882	9,927	73,610
„ and Coffee	770	...	...	...	770
„ with other crops exclusive of Coffee	3,065	60	1,855	...	4,980
Total ...	57,564	2,132	9,737	9,927	79,360
Coffee alone	393	...	...	...	393
„ with other crops	2,161	5	...	...	2,166
Total ...	2,554	5	...	...	2,559

TABLE III.

Rubber Statistics, Federated Malay States, up to 31st December, 1915 and 1916, from Estates over 100 acres in extent.

	Selangor.		Perak.		Negri Sembilan.		Pahang.		Total.	
	1915.	1916.	1915.	1916.	1915.	1916.	1915.	1916.	1915.	1916.
No. of Estates	324	356	365	375	166	190	31	33	886	954
Acreage in possession ...	359,160	382,667	317,997	349,010	209,321	224,843	30,123	40,954	916,601	997,474
Acreage planted up to 31st December 1915 and 1916 ...	211,704	229,091	166,248	191,329	109,723	119,150	11,804	12,389	499,479	551,959
Rubber alone	209,149	226,560	164,022	188,260	108,833	116,580	11,799	12,329	493,803	543,729
Rubber interplanted with catch crops	2,555	2,531	2,226	3,069	890	2,570	5	60	5,676	8,230
Acreage producing	125,261	150,993	91,069	122,683	59,934	72,199	4,866	5,347	281,130	351,222
Planted during 1915 and 1916	5,797	16,830	2,196	14,686	19,301	7,903	1,135	1,312	28,429	40,731

TABLE IV.

Rubber Statistics, Malaya, up to 31st December, 1915 and 1916, from Estates over 100 acres in extent.

—	Federated Malay States.		Johore.		Kelantan and Kedah.		Trengganu.		Total.	
	1915.	1916.	1915.	1916.	1915.	1916.	1915.	1916.	1915.	1916.
No. of Estates	886	954	153	154	151	149	8	6	1,198	1,263
Acreage in possession ...	916,601	997,474	356,773	360,140	225,333	230,873	20,840	16,680	1,519,547	1,605,167
Acreage planted up to 31st December, 1915 and 1916	499,479	551,959	131,396	153,691	70,049	98,436	2,611	2,645	703,535	806,731
Rubber alone	493,803	543,729	129,200	148,169	62,425	90,430	1,611	2,645	687,039	784,973
Rubber interplanted with catch-crops	5,676	8,230	2,196	5,522	7,624	8,006	1,000	...	16,496	21,758
Acreage producing	281,130	351,222	47,609	65,920	19,011	37,368	Nil.	610	347,750	455,120
Planted during 1915 and 1916	28,429	40,731	9,837	4,059	9,400	7,778	809	684	48,475	53,252

TABLE V.

Comparative Table of Rubber Crops, Malaya, 1907 to 1916.

State.	1907.	1908.	1909.	1910.	1911.	1912.	1913.	1914.	1915.	1916.
	Tons Cwt.	Tons Cwt.	Tons Cwt.	Tons Cwt.	Tons Cwt.	Tons Cwt.	Tons Cwt.	Tons Cwt.	Tons Cwt.	Tons Cwt.
Selangor	504 19	824 6	1,641 5	3,148 13	5,106 14	7,482 6	10,110 15	12,601 6	16,061 11	19,996 11
Perak	121 16	171 0	473 9	1,322 8	2,697 4	4,116 18	6,623 17	8,959 7	12,112 1	17,336 18
Negri Sembilan ...	262 0	430 0	601 2	1,160 12	1,918 12	2,518 16	3,339 16	4,203 18	8,138 1	8,596 14
Pahang...	...	...	...	1 2	13 18	74 14	155 9	337 19	548 13	682 8
Johore	81 9	90 0	146 5	296 12	404 2	968 6	1,645 7	2,861 7	4,711 2	6,840 7
Kelantan and Kedah ...	...	...	...	18 11	23 0	79 6	246 18	1,383 18	1,955 0	3,687 7
Trengganu	...	...	...	...	...	...	...	...	...	17 12
Total ...	970 4	1,515 6	2,862 1	5,947 18	10,163 10	15,240 6	22,122 2	30,347 15	43,526 8	57,157 17

TABLE VI.

Estate Labour, Federated Malay States, 1916, from Estates over 100 acres in extent.

Race.	Selangor.	Perak.	Negri Sembilan.	Pahang.	Total.
Tamil men	49,784	43,350	9,230	1,243	103,607
„ women ...	14,843	13,417	2,091	121	30,472
„ children ...	5,852	3,002	422	36	9,312
Javanese men ...	1,728	2,879	1,320	926	6,853
„ women ...	57	1,247	68	493	1,865
Malays	1,152	5,749	1,854	366	9,121
Chinese	11,444	11,721	19,620	1,075	43,860
Others	437	680	251	25	1,393
Labour Total ...	85,297	82,045	34,856	4,285	206,483

TABLE VII.

Estate Labour, Malaya, 1916, from Estates over 100 acres in extent.

Race.	F. M. S.	Johore.	Kedah and Kelantan.	Trengganu.	Total.
Tamil men ...	103,607	8,479	6,953	29	119,068
„ women ...	30,472	1,391	1,827	...	33,690
„ children ...	9,312	390	304	...	10,006
Javanese men ...	6,853	5,017	1,931	25	13,826
„ women ...	1,865	720	66	...	2,651
Malays	9,121	2,990	9,820	3,061	24,992
Chinese	43,860	16,866	11,638	996	73,360
Others	1,393	867	455	4	2,719
Labour Total ...	206,483	36,720	32,994	4,115	280,312

MINUTES OF MEETING OF THE PLANTERS' ASSOCIATION OF MALAYA,

held at No. 12, Market Street, Kuala Lumpur, on 29th August, 1917, at 11 a.m.

PRESENT:

The Honourable Mr. R. C. M. Kindersley (*in the Chair*)

„ H. C. E. Zacharias (*Secretary*)

and the following DELEGATES:

From Batang Padang D.P.A.	...	Messrs. T. H. Stewart and H. Gordon Graham
„ Batu Tiga D.P.A.	...	„ G. H. Bennett and T. J. Cumming
„ Central Perak P.A.	...	Mr. J. S. Ferguson
„ Johore P.A.	...	Messrs. C. Bradbery and C. W. Bradburne
„ Kajang D.P.A.	...	„ P. R. Pinhorn, N. Dakeyne and E. G. Leyne
„ Kapar D.P.A.	...	„ L. Mooijaart, N. B. Bevan and E. H. King-Harman
„ Klang D.P.A.	...	„ Edmund B. Prior and C. A. Buxton
„ Kuala Langat D.P.A.	...	„ G. C. Ash and H. O. Kennedy
„ Kuala Lumpur D.P.A.	...	„ F. G. Harvey and F. Clyde Jeavons
„ Kuala Selangor D.P.A.	...	Mr. R. S. McCulloch
„ Lower Perak P.A.	...	Messrs. W. Dell and R. H. Phillips
„ Malay Pen. Agl. Assn.	...	„ A. R. Morgan and J. W. Kennedy
„ Negri Sembilan P.A.	...	„ V. A. Tayler, G. B. W. Gray, Geo. Grant, W. Buyers, J. Davidson McCulloch, R. Gooch and C. Ritchie
„ Taiping P.A.	...	Dr. W. J. Dixon and Mr. W. H. Tate
„ Ulu Selangor D.P.A.	...	Messrs. W. de L. Brooke and N. H. Dakeyne

HONORARY MEMBER—The Honourable Mr. J. R. O. Aldworth.

VISITORS—Messrs. A. R. Thompson, F. G. Herose, C. R. Heaume, M. D. Fallon, G. C. Bailey, H. Armstrong, H. K. Ward, R. Matthews, J. A. Brown, H. Winson, F. H. M. Staples, A. M. Monkland, G. E. Coombs, B. J. Eaton, H. E. Davidson, W. S. Reeve-Tucker, H. H. Wardlaw, C. J. Arnold, H. B. Dudley, Dr. H. Kingsley and Dr. Malcolm Watson.

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1. The minutes of the meeting held on 27th June are taken as read and confirmed.

2.—WAR RELIEF.

The SECRETARY reports the receipt of the following contributions since 1st April to date:

Batang Padang	$ 480.00
Batu Tiga	990.00
Central Pahang	485.00
Central Perak	783.00
Kajang	561.00
Klang	1,700.00
Krian	876.49
Kuala Langat	670.00
Kuala Lumpur	1,523.18
Kuala Selangor	355.50
Lower Perak	595.10
Negri Sembilan	1,300.00
Taiping	1,077.76
Ulu Selangor	434.44
Total F.M.S. ...	$11,831.47
Colony	136.07
Johore	675.00
Kedah	200.00
Total ...	$12,842.54

and reads the following correspondence:

"KUALA LUMPUR,

"*13th July, 1917.*

"DEAR SIR,

"I am much obliged for your favour of the 26th of April and now beg to hand you draft for £500 being further sums of money collected here for the Planters' War Relief Fund.

"As regards the particulars so kindly given by you, some subscribers here suggest that it would stimulate contributions if you were to let me have periodical statements of accounts of the Fund, say once a month or once a quarter showing the receipts and expenditure. This statement of yours would then be published by me omitting all the names, and I shall be glad to hear whether you think such suggestion feasible.

"Thanking you in anticipation,

"Believe me, etc.,

"(Sd.) H. C. E. ZACHARIAS,

"*Secretary.*

"SIR WILLIAM TAYLOR, K.C.M.G.,

"MALAY STATES INFORMATION AGENCY,

"88, CANNON STREET,

"LONDON, E.C. 4."

The SECRETARY submits the London accounts of the fund for the year ended 30th June, 1917, for which he was obliged to the Local Honorary Secretary of the Federated Malay States War Relief Fund, the Honourable Mr. W. F. Nutt.

As would be seen, the balance to the credit of the Fund on the 30th of June, 1917, was £20,266 13*s.* 3*d.*

The sources from which money had been derived and placed to the credit of the Fund were as follows:

	£	*s.*	*d.*
Money received through the Rubber Growers' Association	9,474	8	5
Money received through the Planters' Association of Malaya	9,070	17	4
Contributions from tin companies having their head office in England	1,828	0	0
Contributions (from the rubber industry) paid direct	170	15	6
Individual subscribers	304	19	0
Interest on investments and bank deposits and balances pay moiety of relief given to individuals from Straits Settlements	200	0	0

The total sum expended on relief had been £955, at a cost of £7 10*s.* 6*d.* for printing, stationery, stamps and bank charges.

FEDERATED MALAY STATES WAR RELIEF FUND, No. 2. STATEMENT OF RECEIPTS AND EXPENDITURE TO 30TH SEPTEMBER, 1916.

Receipts.	Amount. £	s.	d.
Subscriptions, contributions and donations received through the Rubber Growers' Association	4,714	4	4
Remittances from Planters' Association of Malaya including £500 received through the Rubber Growers' ...	5,713	8	4
Subscriptions, contributions and donations from tin mining companies having their head offices in London	912	0	0
Subscriptions, donations and contributions from rubber companies paid direct to Chartered Bank	170	15	6
Subscriptions and donations from individuals (tin industry, £123.6.0 rubber; industry, £37; other, £10)	170	6	0
Interest on bank balances	17	5	0
Discount on Treasury Bills (matured)	86	5	2
	11,784	4	4

Payments.	£	s.	d.	Amount. £	s.	d.
Grants:						
A. St. A. S.	25	0	0			
A. Carter Read for B. R. C. R.	20	0	0			
Mrs. C. L. M.	50	0	0			
„ E. L. F.	30	0	0			
P. Gow for E. P. T.	20	0	0			
Mrs. G. R.	20	0	0			
„ J. B.	25	0	0			
„ L. K.	50	0	0			
H. F.	25	0	0			
				265	0	0
Bank charges				2	3	
Printing, stationery, stamps and sundries				4	7	3
Balance in hand				11,514	14	10
				11,784	4	4

The balance of £11,514 14s. 10d. is disposed of as follows:

	£	s.	d.
Treasury Bills, £9,000 at cost price	8,592	2	1
On deposit in Chartered Bank at seven days notice ...	2,500	0	0
Balance on current account in Chartered Bank ...	411	4	9
Due from Federated Malay States Hospital Fund ...	11	8	0
	11,514	14	10

I hereby certify that I have audited the above statement of receipts and payments with the books and vouchers of the Fund and find the same to be correct. The grants have all been duly authorized by the Committee.

(Sd.) A. H. CULLEN,
Chartered Accountant,
Honorary Auditor.

FEDERATED MALAY STATES WAR RELIEF FUND, SCHEME No. 2. STATEMENT OF ACCOUNT, 1st OCTOBER TO 31st DECEMBER, 1916.

Receipts.	Amount.
	£ s. d.
Balance from last account	11,514 14 10
Payment by the Crown Agents for the Colonies on account of the Government of the Straits Settlements	200 0 0
Remittances from the Planters' Association of Malaya ...	1,000 0 0
Subscriptions and donations from tin mining companies having their head offices in London	856 0 0
Subscriptions and donations from individuals (tin industry, £24 3s.; rubber industry, £100)	124 3 0
Interests on deposits and current bank balances	63 14 10
Discounts on Treasury Bills (matured)	47 17 11
	13,806 10 7

Payments.		Amount.
		£ s. d.
Grants:		
P. Gow for E. P. T. October ...	£ 20 0 0	
F. G. W., 29th June to 25th October, at 15/6 a week	13 3 6	
P. Gow for E. P. T., November	20 0 0	
Mrs. M. S. for November	3 0 0	
F. G. W. balance required to make up pension to £127 10s. 0 per annum to 30th November	24 10 0	
H. F., 2nd grant	25 0 0	
Mrs. E. C., October to Decmber	6 0 0	
„ M. S. for December	3 0 0	
		114 13 6
Bank charges		— 2 0
Printing, stationery, etc.		1 2 9
Balance in hand		13,690 12 4
		13,806 10 7

The balance of £13,690 12s. 4d. is disposed of as under:	£ s. d.
Exchequer Bonds 6 per cent.	2,000 0 0
Treasury Bills, £7,000 at cost price	6,640 0 0
Deposits in Chartered Bank, 4¾ per cent.	2,500 0 0
Balance of current account in Chartered Bank £2,584 12 4	
Less outstanding cheques 34 0 0	
	2,550 12 4
	13,690 12 4

I hereby certify that I have audited the above statement of receipts and payments with the books and vouchers of the Fund and find the same to be correct. The grants have all been duly authorized by the Committee.

(Sd.) A. H. CULLEN,
Chartered Accountant,
Honorary Auditor.

FEDERATED MALAY STATES WAR RELIEF FUND, SCHEME No. 2. STATEMENT OF ACCOUNT, 1st JANUARY TO 31st MARCH, 1917.

Receipts.	Amount. £ s. d.	Payments.	Amount. £ s. d.
Balance from last account	13,690 12 4	Grants and allowances:	
Remittances from the Planters' Association of Malaya	1,000 0 0	Mrs. C. L. M., for 1916 to 1917 £50 0 0	
Contributions received through the Rubber Growers' Association	1,323 18 4	F. G. W., December, 1916, and January to March, 1917 27 14 8	
Contributions and donations from tin mining companies having their head offices in England	60 0 0	Mrs. L. K., moiety of grant 15 0 0	
Contributions and donations from individuals (tin industry)	10 10 0	„ M. S., 17th January to 17th March, 1917 9 0 0	
Interest on deposits and exchequer bonds	36 15 0	„ E. C., January to March, 1917 6 0 0	
Discount on Treasury Bills (realized)	222 17 6	„ G. T. B. 25 0 0	
		A. W. M., gratuity 10 0	
		Mrs. N. B. B. for T. St. P. K. B. 20 0 0	
		„ M. G. W. 25 0 0	
		„ E. L. D. 25 0 0	
		„ M. T. 25 0 0	
		„ I. B. L. 25 0 0	
		Captain G. T., moiety of grant 25 0 0	278 4 8
		Bank charges	3
		Printing, stationery, etc.	1 14 0
		Balance in hand	16,064 14 3
	16,344 13 2		16,344 13 2

The Balance of £16,064 14s. 3d. is disposed of as under:

	£ s. d.
Five per cent. War Loan (£12,000) at cost price	11,400 9 0
Six per cent. Exchequer Bonds	2,000 0 0
Treasury Bills, (£1,000) at cost price	940 0 0
Deposit in Chartered Bank	1,000 0 0
Balance of current account in Chartered Bank £759 17 11	
Less outstanding cheques 35 3 8	724 14 3
	£16,064 14 3

(Sd.) W. T. TAYLOR,
23rd April, 1917.

I hereby certify that I have audited the above statement of receipts and payments with the books and vouchers of the Fund, and find the same to be correct. The grants have all been duly authorized by the Committee.

(Sd.) A. H. CULLEN,
Chartered Accountant,
Honorary Auditor.

73, BASINGHALL STREET,
LONDON, E.C.,
1st May, 1917.

FEDERATED MALAY STATES WAR RELIEF FUND, SCHEME No. 2. STATEMENT OF ACCOUNT, 1st APRIL TO 30th JUNE, 1917.

Receipts.	Amount. £	s.	d.
Balance from last Account	16,064	14	3
Remittances from the Planters' Association of Malaya	857	9	0
Contributions and donations received through the Rubber Growers' Association	3,436	5	9
Five per cent. War Loan Interest	129	7	6
Interest on Balance of Current Account	12	0	7
	20,499	17	1

Payments.	£	s.	d.	Amount. £	s.	d.
Grants:						
F. G. W., March to June	17	1	10			
Mrs. M. S., April to June	9	0	0			
„ E. C., do.	6	0	0			
C. V. P. P.	1	0	0			
C. D'A. C.	50	0	0			
W. E. I. R.	25	0	0			
H. F. (3rd grant)	25	0	0			
Mrs. L. S.	50	0	0			
Mrs. E. L. F. (2nd grant)	50	0	0			
				233	1	10
Bank charges				—	2	0
Balance in hand				20,266	13	3
				20,499	17	1

The Balance of £20,266 13s. 3d. is disposed of as under:	£	s.	d.
Five per cent. War Loan (£12,000) at cost price ...	11,400	0	0
Six per cent. Exchequer Bonds	2,000	0	0
Treasury Bills (£1,000) at cost price...	940	0	0
Deposits in Chartered Bank	5,500	0	0
Balance of current account in Chartered Bank ... ... £436 10s. 1d.			
Less outstanding cheques ... 9 16 10	426	13	3
	20,266	13	3

(Sd.) W. T. TAYLOR,
14th July, 1917.

I hereby certify that I have audited the above statement of receipts and payments with the books and vouchers of the Fund, and find the same to be correct. The grants have all been duly authorized by the Committee.

(Sd.) A. H. CULLEN,
Chartered Accountant,
Honorary Auditor.

73, Basinghall Street,
London, E.C.,
20th July 1917.

The SECRETARY also reports that the Lower Perak Planters' Association had organized an entertainment which he understood had netted well over $1,000 for the Planters' War Relief Fund. The Fund was under a great obligation to Mr. Dell for his kind efforts in that behalf. (Applause).

Mr. KINDERSLEY would repeat that it was up to all planters to subscribe to the Fund. It had been said that the Fund had got all the money that was needed but that was not so, as one had not to think of the present only but of the time after the war. Whether relief payments at present were large or not, the real question would be that of annuities after the termination of the war. More and more men were leaving this country for the front and the Fund should make provision for all of them. They could not all go and fight as they would like to. Therefore the least they who were left behind could do was to make adequate provision for those who had gone.

Mr. HARVEY is afraid that owing to large calls on their pockets for other funds some of the planters had ceased to subscribe to the Fund, and consequently the Planters' War Relief Fund was languishing. There was no doubt that the Fund which advertised most and shouted loudest got the most money, and that was what they had not done. He suggests that the Fund be suspended for a few months, and then be revived early next year, when special personal efforts should be made by all District Planters' Association delegates to obtain large contributions. He was of opinion that by following this method much larger sums of money would be subscribed to the Fund than by following the present mode of monthly subscriptions.

Mr. BENNETT says that $12,800 odd, collected since April last, was a sum worth having, and he did not quite agree with Mr. Harvey that the Fund should be allowed to lapse for a period, and then be revived.

Mr. PRIOR feels that the Fund should be kept going all the time, and if special efforts were needed these efforts should be made continuously.

Mr. KENNEDY agrees and does not see any benefit in delaying special efforts until next year. He suggests that the Standing Committee be instructed to take up the matter vigorously.

Mr. JEAVONS fears that the Standing Committee had a great amount of work on their hands and therefore it would be a better plan to appoint a Special Committee to raise funds and he thinks that every constituent association should have a member on it.

Mr. KING-HARMAN's personal experience was that quite a number of people had ceased to subscribe to the Fund because they had the idea that the people for whom the Fund was intended were not getting the relief they needed. The fact was that people did not apply for relief but that was no reason why those in charge in London should not make every possible effort to trace all the men who had left from here and their dependents so that, wherever necessary, relief could be granted. He himself had brought a particular case to the notice of the Honourable Mr. W. F. Nutt who had immediately taken up the matter with satisfactory results.

Mr. TAYLER suggests that the matter be placed again on the agenda for the next meeting.

Mr. STEWART thinks that the delegates present ought to go back and tell their Association about the needs of the Fund.

Mr. KINDERSLEY takes it that it was the feeling of the meeting that the two suggestions of Mr. Tayler's and Mr. Stewart's should be carried out. As regards Mr. King-Harman's remarks he knew that the London Committee did their utmost to get into touch with all who had gone Home from here so that in case of mishap their dependents could obtain immediate relief from the Committee. He did not see what else the London Committee could do, but if there were any other cases known to people out here which had escaped the notice of the London Committee, their own Secretary should immediately be told about it and would then communicate with Sir William Taylor.

3.—MOTOR CARS.

The SECRETARY reports the dispatch of the following letter which, however, had so far only resulted in a formal acknowledgment:

"KUALA LUMPUR,
"*4th July, 1917.*

"SIR,

"I have the honour to confirm my letter of the 9th of March, *re* motor cars and am instructed to point out that the matter is one of great urgency.

"The question was again considered at the last meeting of this Association, when further complaints of the present unsatisfactory state of affairs were voiced, and it was earnestly hoped that the Government would take early steps to end a situation which is rapidly becoming intolerable.

"I have, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary,*

"UNDER SECRETARY,
"FEDERATED MALAY STATES,
"KUALA LUMPUR."

4.—INDIAN LABOUR.

The SECRETARY reads the following correspondence:

"KUALA LUMPUR,
"*3rd July, 1917.*

"No. 1465/17.

"SIR,

"With reference to previous correspondence regarding the introduction of labour from India, I am directed to inform you that a letter has now been received from the Secretary to the Government of Madras stating that that Government has directed that the

number of emigrant labourers who may be shipped to Malaya from the 1st January to the 31st December, 1917, be fixed so as not to exceed 82,000 adult coolies (males and females).

"2. The Government of Madras has also directed that no restriction be placed on the emigration of minors under eighteen years of age accompanying their guardians.

"I have, etc.,
"(Sd.) S. McArthur,
"*Under Secretary to Government, F.M.S.*

"The Secretary,
"Planters' Association of Malaya,
"Kuala Lumpur."

"Kuala Lumpur,
"*2nd July, 1917.*

"No. 323/17.

"Sir,

"I have the honour to notify you that I have received information that the Managing Agents of the British India Steam Navigation Company, Limited, have increased the deck fares from the Straits to Negapatam and Madras to $16.50 from Singapore, $15.50 from Port Swettenham, and $12.50 from Penang. The increase to have immediate effect.

"2. It is stated that the increase is rendered necessary owing to the enormously increased cost of running the steamers.

"I have, etc.,
"(Sd.) J. W. C. Ellis,
"*for Controller of Labour, F.M.S.*

"The Secretary,
"Planters' Association of Malaya,
"Kuala Lumpur."

"Kuala Lumpur,
"*23rd July, 1917.*

"No. 363/17.

"Sir,

"In the absence of the Controller of Labour, I am directed to inform you that a letter has been received from the Superintendent, Emigration Depôt, Negapatam, inviting attention to a tendency to increase commissions to kanganies which has been noticeable lately.

"2. The Superintendent points out that this can only result from a misunderstanding of the present situation as regards recruiting. He reports that 'the planters were never in a better position to obtain labour from India than at the present time; if extra tonnage had been available the year would have exceeded the highest record of former years.' Yet in this very favourable season commissions of Rs. 12 have become common.

"3. I would therefore ask that the views of the Superintendent on the prospects of recruiting may be made known to employers as generally as possible, and that they be all urged not to give commissions exceeding Rs. 10.

"4. An exception is, however, made in the case of the Northern Telugu districts where higher commissions are sanctioned as railway fares have been increased and the recruiters are liable to incur increased expenses in the event of labourers whom they recruit being rejected.

"I have, etc.,

"(Sd.) J. W. C. ELLIS,

"*for Controller of Labour, F.M.S.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

BATU TIGA DISTRICT PLANTERS' ASSOCIATION.

"BATU TIGA,

"SELANGOR, F.M.S.

"*10th August, 1917.*

"DEAR SIR,

"With reference to the question regarding the restriction of emigration, I enclose herewith copy of letter addressed to Messrs. Binny and Co., Ltd., from the Emigration Agent, Federated Malay States and Straits Settlements, Madras.

"I am, etc.,

"(Sd.) T. J. CUMMING,

"*Honorary Secretary and Chairman.*

"THE SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

"OFFICE OF THE EMIGRATION AGENT,

"STRAITS SETTLEMENT AND FEDERATED MALAY STATES,

"MADRAS,

"*13th July, 1917.*

"GENTLEMEN,

"A larger number of kanganies have registered licences in Madras and Negapatam during 1917 than in any previous year, and the accommodation of the steamers available would be quite inadequate for the larger number of labourers who would ordinarily be brought to the depôts by the recruiters if the activities of the latter had not been restricted.

"In previous years we have had the services of an extra steamer practically once a fortnight during the busy recruiting season, during the present year one extra steamer has sailed. Extra steamers have not been asked for this year for obvious reasons.

"In order to prevent congestion in the depôts at Avadi and Negapatam, and in order to distribute facilities for recruiting as equitably as possible, it has been found necessary to prevent kanganies who have shipped coolies from bringing any more coolies to the depôts for two or three shipments. Even with such a restriction in force, further precautions have been taken temporarily to stop recruiting (for a few days at a time) until the congestion has been relieved.

"I would suggest that you point out to these managers that your Shipping Department has booked no deck passengers for some considerable time in the interests of labourers recruited for rubber estates in Malaya.

"I have, etc.,

"(Sd.) H. C. BATHURST,
"*Emigration Agent, S.S. and F.M.S.*

"MESSRS. BINNY & CO., LTD.,
"MADRAS."

EXTRACT FROM LETTER FROM MADURA CO., LTD., DATED 1ST AUGUST, 1917.

"With regard to complaints from your kanganies that they are not allowed to bring coolies weekly for shipment, we beg to say that there is no fixed rule about this, but when the camp is congested, the Depôt Superintendent has to regulate arrivals from time to time. Owing to Government having taken over the control of shipping, there are not the extra steamers available as in previous years, hence the greater difficulty in despatching coolies immediately they are recruited this year. No deck passengers other than estate coolies have been carried by the steamers for some weeks past, and all possible is being done.

"The congestion in the camp has been entirely cleared, and kanganies are now allowed to bring in coolies weekly for shipment. We would also advise that as the fair season begins shortly, there is ample space on the steamers plying between here and the Straits, and there will be no congestion in the camp for some months to come, unless the Government commandeers steamers or any other unforeseen event alters conditions."

The SECRETARY also reports that the total number of immigrants for the first six months of the year was as follows:

Total number of state-aided passengers—	
Adults—Male	28,344
Female	6,962
Minors	3,511
Ordinary passengers—	
Adults—Male	5,736
Female	768
Minors	466

Total, 41,810 adults, 3,977 minors.

The Honourable Mr. J. R. O. ALDWORTH supplements this information. The July arrivals had been 8,655 adults and 744 minors, whilst in August up to date there had been 4,626 adults and 265 minors.

Mr. BENNETT thinks that a great deal of shipping space and expense could be saved if the recent order was rescinded under which a kangany on the expiration of his licence had to return to the estate to get it extended. Formerly licences were extended in India and he regrets that this procedure had been departed from. Another point was that the Penang office of the Labour Department would not tell them the number of the licence issued to the kangany. The lack of this number made it very difficult for them to trace the kangany and he could not understand why the office would not even reply to such a request as this.

Mr. HARVEY says that the Indian Immigration Committee had made the rule *re* extension of licences on purpose, the idea being that short-term licences served as a spur to hurry up kanganies. He thinks the rule worked very well and that the results had been excellent.

As regards the question of rejects which had been discussed at a former meeting, his Association had now received a reply which, however, gave little information, the reasons given ("too old", "too young," "has fever," etc.) being quite inconclusive, and his Association therefore hoped that the Planters' Association of Malaya would take up the matter again.

Mr. BROOKE'S experience was similar and he had received the same complaints.

The Honourable Mr. J. R. O. ALDWORTH agrees with Mr. Harvey regarding short-term licences and says that the new rule had been made under pressure from the Madras Government. As regards the failure of the Penang office to reply to planters *re* numbers of licences issued to kanganies he would look into this.

Replying to the question of rejects he would suggest that the large number of such rejects at the present time was dictated by the insufficiency of shipping accommodation. As long as this dearth continued it seemed to him to be to the advantage of planters to get only coolies of the best physique.

Another point was that in recent years the kanganies had no longer to pay out of their own pockets the return fares of rejects to their villages. The result was that lots of people who never intended to emigrate went for a free trip to the coast and back again at the expense of the planter. He thinks that if the old system was reverted to under which kanganies had to pay these expenses out of their own pockets, the number of rejects would automatically be reduced.

Mr. HARVEY enquires whether it was not a rule made by the Government of Madras and not the choice of the planter that all return fares of rejects had to be paid by the would-be employer.

5.—JAVANESE LABOUR.

The meeting goes into Committee and after discussion on the subject Mr. McCulloch proposes a resolution which is seconded by Mr. Ritchie and carried unanimously.

6.—TODDY.

The SECRETARY lays on the table the official proceedings and report of the Toddy Commission and reads the following letter:

"KUALA LUMPUR,
"*10th August, 1917.*

"No. 343/17.

"SIR,

"I have the honour to invite your attention to the report recently issued on the toddy question in which the Commission say:

"In paragraph 46. 'On a pay-day or a festival day there is an enormously multiplied consumption. You cannot draw more than its regular supply from a tree already tapped, and you cannot tap new trees just for the emergency. It is not clear, therefore, how the increased demand of a festival day is met; while it is easy to understand that the seller may be tempted by adulteration, not necessarily noxious, to increase his supply while obliged to maintain its body and flavour.'

"And in paragraph 49. 'We hope in this connection that estates using the same toddy-shops will endeavour to arrange for different pay-days.'

"2. I should be much obliged if you could advise as to whether the suggestion contained in paragraph 49 of the report is considered practicable and as to the degree of support which such a movement would be likely to obtain among your members.

"I have, etc.,
"(Sd.) J. R. O. ALDWORTH,
"*Controller of Labour, F.M.S.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

Mr. KINDERSLEY says that the question of toddy had been referred back by meeting after meeting pending the issue of the report, first of the Toddy Committee and afterwards of the Toddy Commission. They had now before them a memorandum on the whole subject by Mr. Mooijaart and he understands from the Secretary that this memorandum, to which had been appended memoranda by Mr. Ford and Dr. Watson, had been circulated among all delegates.

He felt that the Association owed a great deal to Mr. Mooijaart, in connection with this matter, for the enormous amount of work which he had done on their behalf.

With Mr. Mooijaart's very able memorandum before them he need not take up much of their time, and would remark that, in his opinion, planters would entirely agree with the common sense views expressed by him.

It was most unfortunate that the Commission, which might have been of great service, had it not resolved itself into a medical controversy, had resulted, as far as the planter and the coolies were concerned, in absolutely nil, and the personal element that was introduced was most regrettable.

This Association was convinced from bitter practical experience of the danger and harmfulness of drinking old or adulterated toddy and to pretend that the subject was a new one suddenly sprung upon the Government was nonsense. It was astonishing to find that a Commission in the Federated Malay States should, to all appearance, do its best to try and whitewash conditions which makes it possible for the Tamil cooly to poison himself habitually with toddy of which it was acknowledged only a small proportion could be considered as wholesome.

It seemed to him that what was required was practical common sense. The toddy-shops were so many public houses, from which the Government derived a considerable revenue, and they wanted to see those public houses placed under control as regards both the preparation and sale of toddy in order that the Tamil cooly may only be able to obtain wholesome liquor.

He felt that their thanks, their very great thanks, were due to Dr. Watson for forcing the subject on the notice of the Government. With their thanks he also felt that they should convey to Dr. Watson their great regret that, in endeavouring to assist them, he should have been placed in so invidious a position and subjected to what can only be called a deliberate personal attack.

In this connection he would quote the last paragraph of Mr. Ford's memorandum which was as follows:

"A perusal of the report will show that many expressions have been used both detrimental and, in my opinion, unfair to Dr. Watson, and the writer of the leader in the *Pinang Gazette* of the 12th July last would appear to have some justification for saying: 'Dr. Watson is charged with being out to incriminate toddy and he might well retort that the Commission was just as much 'out' to riddle his evidence and ridicule his conclusions about 'toddy poisoning.'"

In this connection he had received this morning a letter from the Chief Secretary reading as follows:

"KUALA LUMPUR,
"*29th August, 1917.*

"SIR,

"My attention has been drawn to a memorandum published in the *Malay Mail* of the 28th instant, which is said to have been

addressed to the Planters' Association of Malaya by Mr. L. Mooijaart. In that memorandum occurs the following passage:

"'We now know that when the Honourable the Chief Secretary appointed a Committee, he was aware that His Excellency the High Commissioner proposed to appoint a Commission to enquire into certain aspects of the same. It is regretted that the Government shielded from the ken of the unofficial members of Committee the fact that it was proposed to appoint a Commission.'

"The above statement is entirely incorrect. The Committee was appointed soon after the meeting of the Association when Dr. Watson made his speech. This was on the 26th April, 1916. There was then no suggestion or intention of appointing a Commission. By my instructions Dr. Watson was asked by letter dated the 15th June, for all the information he could give to put before that Committee. His reply giving the information is dated the 11th July, 1916. This letter was referred to the Senior Health Officer for his comments and it was only after the receipt of the Senior Health Officer's memorandum dated the 16th August, 1916, that it was decided, on my recommendation, to appoint a Commission to investigate the allegations which had been made by Dr. Watson. The reason for appointing a Commission was that a Commission would have power to summon witnesses and to take evidence on oath, whereas the Committee had not such powers.

"The statement in the memorandum addressed to the Association by Mr. Mooijaart that when I, the Chief Secretary, appointed a Committee I was aware that the High Commissioner proposed to appoint a Commission has no foundation whatever.

"I have, etc.,

"(Sd.) E. L. Brockman."

Mr. Mooijaart in reply says that this letter of the Chief Secretary surprised him greatly. He naturally took the official report of the Toddy Commission as issued by Government as his standing and he would read out the following quotations from that report:

(1) Page 372 (Exhibits of "Steps leading to the appointment of the Toddy Committee and Commission").

"13th of May, 1917, the Chief Secretary sends the papers to the High Commissioner."

"14th of May, 1916, the High Commissioner replies that he proposes to appoint a *Commission*."

(2) On page 387 of the report they would further see a letter from the Under Secretary, dated 22nd May, 1916, informing the Planters' Association of Malaya that the Government had decided to appoint a Toddy *Committee*.

All he could say, therefore, was that if the Commissioners' report was correct his memorandum must stand.

Mr. Kennedy says they were all agreed that in this toddy question they had a big grievance, and what was now really wanted was a remedy and that remedy was responsible control, for responsible control they had not got at present.

The root of the whole evil lay in the present system of granting licences.

The whole toddy traffic of the country was at present controlled by Klings and it might safely be taken that the majority of these men are irresponsible and unscrupulous and their only interest to make as much money as possible, whether at the expense of the health of the cooly or not.

The solution of the whole toddy problem may be summed up in two words, namely, "responsible control." He had a suggestion to make with regard to this but before doing so would like to put before them an experience he had with a toddy-shop during the present month.

On the estate which he represents there are three toddy-shops on different divisions. The licence of one of these shops was cancelled at the end of July owing to misconduct on the part of the lessee.

He had long wished to get at the bottom of what profit was actually made in these toddy-shops, also to what extent dilution and adulteration was taking place, so, on behalf of the estate he applied to Government to give him the licence, and at the same time pointed out that these shops could be much better controlled if under European supervision than if under a Kling and that he wished to make the experiment. He stated that he would take over the shop on Government's own terms, that the coolies themselves only would participate in some form or other in the profits, that separate accounts, also a separate banking account, would be kept and that these would be open to inspection by Government Officials at all times.

The Resident of Perak agreed to let him have it on these terms, and stated that the monthly rental would be two-fifths of the total drawings as from the 1st of August.

The old lessee, a Kling, paid $300 a month rental, and his average drawings as shown in the Government books kept in the shop was about $750 a month.

The actual drawings for the present month under European supervision will probably reach $1,300, although the amount of toddy available for sale was not equal to the demand and the shop had been closed almost every night long before the specified closing time.

The old lessee rented 100 trees monthly from the estate, and apparently he always had a full supply of toddy to meet the demand, and in fact his books showed that he was rejecting from 10 to 20 gallons daily. Since the estate took the shop over it had been found that the amount of toddy from 100 trees is nothing like sufficient to meet the demand, and a further 80 trees have had to be opened to give an adequate supply.

In the light of these results one can only conclude that the old lessee was diluting and doctoring his toddy to an extraordinary degree, and he estimates his profit at somewhere about $1,000 a month. He did not for a moment believe that this case was an exception but that in a greater or lesser degree it is typical of what is actually going on throughout the whole country.

The coolies are now being supplied with good, wholesome toddy and they highly appreciate the change.

Drunkenness during the month had been non-existent and there has not been a single case of trouble in the lines.

From this it seems clear that the toddy question would give very little trouble if the sale of it was under responsible control.

He suggests that every estate in the country should have a toddy-shop of its own, if possible, this does not necessarily mean excessive consumption if the shops are properly controlled, that these shops should be under the full control of the manager, that the coolies on the estate participate in some form or other in all profits from the toddy-shop, that separate account books and banking account be kept, so that all dealings may be made perfectly clear to Government.

Coolies would then have no inducement to leave their own estate and visit toddy-shops perhaps miles away on a public road.

This would probably prevent a great number of deaths from pneumonia which is frequently caused by coolies lying drunk on the public roads for hours in wet weather. The toddy-shops on public roads should be taken over and controlled by Government itself.

These suggestions could no doubt be improved upon but, if something like what he had outlined were acted upon, not only would they hear little more of excessive drunkenness, or, at least harmful results from toddy drinking, but that discipline and health on estates would be better and labour conditions would be a great deal more attractive than they were at the present time. He was so satisfied with the results of the working of this particular toddy-shop that he would certainly endeavour to get the licence for the other two shops as well.

If he was fortunate enough in obtaining control of all three shops, then the toddy problem would certainly have been solved as far as his own place is concerned.

He intended sending in a full report to Government of the results of the working of the particular toddy-shop he had mentioned, and this might strengthen their hands if this Association cared to act on lines similar to those he had suggested.

Mr. Bradbery is glad to be able to report that the Johore Government were already carrying out the suggestion made by Mr. Kennedy in that the management of toddy-shops on their estates was left entirely in the hands of the manager and he agrees with Mr. Kennedy that the results of this method were excellent in every way.

Mr. KINDERSLEY understands that Mr. Kennedy intends to send a report on the working of this system to the Perak Government and he suggests that a copy of that report be appended to the minutes of this meeting. (*Vide* Appendix).

Mr. HARVEY would like to know what an estate was to do which had no coconut trees of its own from which to draw its supply of toddy.

Mr. RITCHIE says that his own experience had been that it was possible to get toddy from a distance but that the transport in that case did away with all profits.

Mr. KENNEDY suggests that all coconuts along public roads should be made public property. He also thinks that toddy-shop licences should be issued for one month only.

Mr. MOOIJAART says that this latter proposal would inflict great hardship on the toddy-shop-keeper. He feels that the toddy question had now been sufficiently ventilated and that it was really time that something was done promptly. He would therefore propose that Government be asked:

(1) Whether and when an European Inspector is to be appointed to collect information with regard to the toddy traffic as suggested by the Toddy Committee;

(2) That the Government be asked to have the following monthly returns published in the local papers—

State

District

Number toddy-shops

Number of times each toddy-shop is visited by European Health Officer

Number of samples of toddy analysed

Number of samples of toddy found to exceed standard of acidity or alcohol

Number of samples of toddy examined for adulterants (what adulterants are looked for ?)

Number of samples of toddy found adulterated

Number of prosecutions.

If the Government complied with this request then at least they would know that they meant business and it was obvious that before anything could be done data were required.

There was one other point on which he felt that something ought to be done and that was the lack of any means at the present time for doctors to come together and discuss their problems and exchange their experiences. Medical practitioners in this country were to a great extent isolated and new-comers had got to find out most things laboriously for themselves. His suggestion was therefore that the Government should invite all medical practitioners to periodical, say annual, conferences to discuss and study the problems of the day. Incidentally such conferences were bound to promote more harmonious relationship than those existing at present

and he therefore would add as a third resolution "that Government be asked to consider the advisability of inviting members of the medical profession to attend an annual medical conference."

Mr. MORGAN seconds the proposal.

Dr. DIXON entirely agrees with all that both Mr. Mooijaart and Mr. Kennedy had said, and as regards the medical conference he is convinced that all estate doctors would welcome such conferences.

Mr. STEWART enquires whether it would not be possible to form a Medical Advisory Board of the Planters' Association of Malaya.

Mr. MOOIJAART's proposals are then put to the meeting and carried unanimously.

Mr. KINDERSLEY remarks that before they could pass on to the next item on the agenda they ought formally to adopt the memorandum prepared by Mr. Mooijaart on the subject. In doing so he thinks they ought to couple with it a very hearty vote of thanks to him for the immense trouble he had taken in the matter. (Applause.)

This is seconded by Mr. McCulloch and carried unanimously.

7.—RE-PRINTING OLD MINUTES.

The SECRETARY submits quotations for the issue of the minutes of the past 10 years arranged according to subject matter.

Mr. TAYLER thinks that the quotations were such as to make it impossible in the present state of their finances to entertain the idea and he would therefore recommend that the matter be allowed to stand over for the time being.

Agreed to.

8.—MACHINERY ENACTMENT.

The SECRETARY reads the following correspondence:

"KUALA LUMPUR,
"*6th July, 1917.*

"SIR,

"I have the honour to acknowledge receipt of your letter of the 1st ultimo. This and your formal letter of the 27th of April were placed before the meeting of my Association held on the 27th ultimo., when I was instructed to thank you for so courteously referring the matter to us.

"At the same time, I was to point out to you that it has been an admitted fact for many years among Machinery and Factory Inspectors at Home that any device for stopping a machine in case of accident is almost wholly useless if the person to whom the accident is happening has to operate it. Anyone who has been an eye-witness to such accidents, or to whom they may have happened, will corroborate this statement very fully. It is, therefore, our opinion that the use of such devices on each separate rubber machine is neither necessary nor efficacious.

"The use of dog-clutches (which are not really at all suitable for putting in and out of gear while the machinery is running) need not be discontinued if the following suggestion be carried out:

"A single efficient friction clutch should be installed between the engine, or prime mover, and the driven machinery. In the great majority of factories this clutch is already in existence and in those where it is not, would not be particularly difficult nor expensive to instal. This clutch would be fitted with a simple and reliable spring release gear, somewhat similar in design to that in use on the Werner-Pfleiderer Scrap Washer. The wire rope actuating this gear would be run at a convenient height over the whole battery of rubber machines, thus enabling any, or all, of the operators to stop the whole of the machines almost instantaneously. The mere fact of there being several machines running off the same shaft would ensure a quick stop; far quicker than that of a single machine.

"I was further instructed to inform you that in the cases of engines not already fitted with friction clutches my Association trusts that you will allow the matter to stand over till after the war. Supplies of friction clutches cannot be obtained from Britain and local engineering firms are finding it almost impossible to supply the ordinary requirements of the industries of the country at the present time, and in all probability difficulty will be experienced in obtaining permission to make the best type of clutches out here, such being patented. At any rate permission has been refused to make Heywood and Bridge's clutches out here.

"I may say that Mr. Platt's specification does not appear to include the supply of the necessary clutch. It applies, I think, to the actuating gear only, and presumes that a clutch is already there.

"In conclusion I would assure you that the members of my Association are most willing to carry out your wishes so far as is at present possible in connection with the safeguarding of life and limb in rubber factories.

"I have, etc.,

"(Sd.) H. C. E. Zacharias,
"*Secretary.*

"Senior Warden of Mines,
"Federated Malay States,
"Kuala Lumpur."

"Kuala Lumpur,
"No. 11 in 199/17. "*2nd August, 1917.*

"Sir,

"I have the honour to acknowledge receipt of your letter of 6th July last and to inform you that I referred it to the Chief Inspector of Machinery, who was formerly a Board of Trade Inspector—and append a copy of his remarks.

"2. I agree with the regulation proposed by the Chief Inspector of Machinery in his last paragraph and it practically coincides with the fourth paragraph of your letter, now under reply, and unless objected to it will be adopted.

"3. As regards cases of plant, not fitted with friction clutches, replacement may, of course, stand over until the times admit of procuring the necessary apparatus.

"4. Mr. Platts' specification deals with the actuating gear only.

"5. Would you kindly convey my thanks to your Association for their assistance in this matter.

"I have, etc.,

"(Sd.) W. EYRE-KENNY,

"*Senior Warden of Mines, F.M.S.*

"SECRETARY,

"PLANTERS' ASSOCIATION OF MALAYA,

"KUALA LUMPUR."

"REMARKS ATTACHED TO 'P.P., C.S.O., MINES 1763/1917."

"The whole matter has come down to this. Will the Association be willing to fit to each battery of machines an approved device to be worked by *hand* or *foot* from any machine or main engine.

"2. The principle of a trigger releasing a falling weight is certainly simpler than any declutching gear I have seen, for naturally the energy required is only the release of the trigger.

"3. I do not agree that given a *foot* and *hand* release the victim will not be able to help himself. However, we might pass this over and if gear, *foot* and *hand*, is within the reach of the manipulator of each machine and such gear (a piece of wire probably) is direct coupled to a suitable clutch on the main drive this would do. But the declutching of the main drive must be instantaneous and, therefore, I am strongly in favour of a falling weight which *must* "fall," than spring gears with an inoperative spring through non-use.

"4. I suggest that the regulation, given in my remarks under date 25th May, 1917, in these papers, now reads:

"'In all existing gears a declutching appliance should be fitted to the satisfaction of the Inspector at the main drive, such appliance being actuated by *hand* or *foot* from the prime mover or any part of the battery of machines.'

"(Sd.) W. J. TROWELL,

"*Chief Inspector of Machinery,*

"*31st July, 1917.*

"SENIOR WARDEN OF MINES."

9.—AGRICULTURAL CONFERENCE.

The SECRETARY reads the following letters:

"KUALA LUMPUR,
"*4th July, 1917.*

"SIR,

"I have the honour to acknowledge receipt of your letters 419 of the 17th of May and 8th of June, and in reply beg to say that I am writing to all Constituent Associations asking them to nominate one member each to sit on the General Committee.

"I am further instructed to say that in the opinion of my Association it will be advisable to leave to this General Committee the appointment of a small Executive Committee.

"I have, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

"DIRECTOR OF AGRICULTURE,
"FEDERATED MALAY STATES,
"KUALA LUMPUR."

LETTER ADDRESSED TO ALL CONSTITUENT ASSOCIATIONS.

"KUALA LUMPUR,
"*5th July, 1917.*

"DEAR SIR,

"In view of the success attending the last Agricultural Conference, it has been decided to make arrangements for holding future Agricultural Conferences annually. At the last meeting of this Association it was further decided that each Constituent Association should nominate a representative on the General Committee which would be in charge of such future Agricultural Conferences and I shall now be glad if your Association will kindly appoint a representative accordingly and inform me in due course of their choice.

"Believe, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*"

The SECRETARY reports that the following gentlemen had so far been nominated:

Mr. J. W. Kennedy	from the	Malay Peninsula Agricultural Association
„ L. Mooijaart	„	Kapar D.P.A.
„ W. Dell	„	Lower Perak P.A.
„ J. S. Ferguson	„	Central Perak P.A.
„ T. J. Cumming	„	Batu Tiga D.P.A.
„ Gordon Graham	„	Batang Padang D.P.A.

10.—CURTAILMENT OF RUBBER SHIPMENTS.

The SECRETARY reads the following correspondence:

"KUALA LUMPUR,
"*5th July, 1917.*

"SIR,

"I have the honour to inform you that at the last meeting of this Association held on the 27th ultimo, the curtailment of rubber shipments was discussed and I was instructed to convey to you the following resolution which was unanimously passed at the said meeting, *viz.*: 'That the Government be requested to be good enough to give early intimation to the Planters' Association of Malaya of any information they may be in possession of with regard to curtailments of rubber shipments; (2) that the Government be requested to consider the advisability of appointing a Government officer as a 'Local Shipping Adviser' who would collect information as to tonnage and be in touch with the Shipping Conferences and the British Controller of Shipping.'

"I have, etc.,

"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

"THE HONOURABLE,
"THE CHIEF SECRETARY,
"FEDERATED MALAY STATES,
"KUALA LUMPUR."

"KUALA LUMPUR,
"*26th July, 1917.*

"No. 2688/17.

"SIR,

"I am directed to acknowledge the receipt of your letter dated 5th July, 1917, forwarding a resolution passed by your Association on the subject of the curtailment of rubber shipments and the appointment of a local 'Shipping Adviser.'

"2. The Government has received no official intimation that shipments of rubber from Malaya are being curtailed, but will not fail to notify your Chamber should it receive such information. In the meantime I may mention that in the latter half of 1916—9,203 tons, and in the first half of 1917—9,718 tons of rubber were exported from the Federated Malay States in ocean-going steamers to destinations other than the Straits Settlements.

"3. In regard to the proposal regarding a 'Shipping Adviser' I am to state that the Government of the Straits Settlements has appointed a Shipping Committee which advises on the needs of Malaya as a whole, and, that in the circumstances, it is not considered necessary to appoint a Government Officer as a 'Local Shipping Adviser.'

"I have, etc.,

(Sd.) S. MCARTHUR,
"*Under Secretary to Government, F.M.S.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

11.—RAILWAY LIABILITY.

The SECRETARY reports having sent the following letter to which, however, he had so far been without more than a formal acknowledgment:

"KUALA LUMPUR,
"*5th July, 1917.*

"SIR

"I have the honour to inform you that at the last meeting of this Association held on the 27th ultimo, the practice of the railway was criticized of refusing to grant receipts at small stations for rubber delivered for dispatch unless such rubber actually leaves such station on the same day. This attitude of the railway causes very serious inconvenience and trouble to the producers, and the meeting unanimously passed the following resolution which I was instructed to convey to you, *viz.*: 'That the attention of Government be drawn to the inconvenience caused by the railway regulation now in force by which a receipt for goods delivered for dispatch is refused unless the said goods can leave by train the same day; and that the Government be asked to amend the present regulation in order that, where accommodation is available for their reception, a receipt may be given for all goods delivered between the hours of 7 a.m. and 5 p.m.; at any rate at stations whose outward goods traffic reaches a certain minimum.'

"I have, etc.,
"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

"UNDER SECRETARY,
"FEDERATED MALAY STATES,
"KUALA LUMPUR."

12.—EXPERIMENTAL FARMS.

The SECRETARY reads the following letter:

"KUALA LUMPUR,
"*5th July, 1917.*

"SIR,

"I have the honour to inform you that the question of creating new agricultural industries in the Malay Peninsula was considered at the last meeting of this Association held on the 27th ultimo. After some discussion the following resolution was unanimously passed, *viz.*: 'This Association considers that as the Malay Peninsula, as far as agricultural products are concerned, is practically dependent upon the one staple, rubber, it is highly desirable that something should be done in the way of creating new agricultural industries for the future welfare of Malaya, and that the Governments concerned should establish experimental farms throughout the Peninsula with a view to ascertaining what other agricultural crops can be successfully and profitably produced in the different provinces. The Association suggests that the Governments of Malaya appoint a Committee consisting of planters nominated by the Planters'

Association of Malaya and approved by the Governments, with the Federated Malay States Director of Agriculture as Chairman, to go into the whole matter and to make recommendations as to how the object in view may best be realized.'

"I was instructed to forward this resolution to His Excellency and to express a hope that he will direct the Governments of British Malaya to form a Committee as suggested in the said resolution.

"I have, etc.,

"(Sd.) H. C. E. ZACHARIAS,

"*Secretary.*

"SECRETARY TO HIS EXCELLENCY THE HIGH COMMISSIONER,

"FEDERATED MALAY STATES,

"SINGAPORE."

MR. KINDERSLEY understands that the matter was being actively considered by the Federated Malay States Agricultural Department who he believes were quite in favour of the suggested Committee being appointed.

13.—PLANT DISEASES.

The SECRETARY reads the following correspondence:

LETTER ADDRESSED TO THE ADVISER TO THE GOVERNMENT OF KEDAH AND THE COLONIAL SECRETARY, STRAITS SETTLEMENTS, SINGAPORE.

"KUALA LUMPUR,

"*5th July, 1917.*

"SIR,

"I have the honour to inform you that the question of rubber tree diseases in the State of Kedah/Province Wellesley, came up for discussion at the last meeting of this Association held on the 27th ultimo. The meeting viewed with great apprehension the fact that no Governmental control over such plant diseases exists at present in this territory, notwithstanding the extensive areas under rubber.

"The meeting subsequently passed a resolution expressing its opinion that it was of vital importance that the Government concerned should take the necessary steps to create a department for the control of plant diseases. At the same time it was recognized that at the present time there would no doubt be difficulties in the way of obtaining the necessary staff, and I was instructed to point out that in the circumstances this Association considers it advisable that your Government make some temporary arrangements for the loaning of the services of members of the Federated Malay States Department of Agriculture.

"I have, etc.,

"(Sd.) H C. E. ZACHARIAS,

"*Secretary.*"

"COLONIAL SECRETARY'S OFFICE,
"SINGAPORE,
"*10th July, 1917.*

"No. 5344/17.

"SIR,

"In reply to your letter of the 5th July, 1917, I am directed to inform you that no steps can be taken towards an amalgamation of the Agricultural Departments of the Straits Settlements and Federated Malay States until more normal times prevail.

"2. Meanwhile this Government feels sure that the Government of the Federated Malay States will readily render assistance if requested in the matter of the prevention or suppression of plant diseases.

"3. I may mention that arrangements have been made for the Director of Agriculture to visit Malacca and report on the question of rubber trees and to recommend measures for preventing their spread.

"I have, etc.,
"(Sd.) R. CRICHTON,
"*for Colonial Secretary, S.S.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

"ALOR STAR,
"*10th July, 1917.*

"No. 2548/35.

"SUBJECT.

"AGRICULTURAL DEPARTMENT IN KEDAH, PROPOSED CREATION OF.

"SIR,

"I have the honour to acknowledge the receipt of your letter dated 5th July, 1917, the contents of which are receivingattention.

"I have, etc.,
"(Sd.) J. S. W. ARTHUR,
"*Acting for Adviser to the Kedah Government.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

Mr. TAYLER considers the attitude of the Colony very unsatisfactory and is afraid that this would be merely a repetition of the situation which had arisen only a short time ago in connection with the locust danger. It was quite evident that control ought to be under one department and however small the number of officers was

that was no reason for awaiting the centralization and co-ordination of all work. One visit of the Director of Agriculture to Malacca for instance was not at all what was needed. Supervision over plant diseases, etc., was urgently needed outside the Federated Malay States and all such supervision should be controlled by one head of department. He also advocates the advisability of officers of the department delivering lectures in districts outside the Federated Malay States. He would, therefore, propose that "in view of the known increase in rubber diseases the various Governments concerned be urged to arrange for the Federated Malay States Department of Agriculture to extend control to Colonial possessions and States under British protection in the Peninsula."

14.—ESTATE HOSPITALS.

The SECRETARY reads the following correspondence:

"KUALA LUMPUR,
"*3rd August, 1917.*

"SIR,

"I have the honour to acknowledge receipt of your letter No. 4528 of the 15th of June. This letter has been considered by my Standing Committee who have instructed me to enquire whether the statements and considerations contained in our Chairman's letter to you of 27th December, have been submitted to the Government of Madras; (2) If so, whether the Government of Madras disagree with our conclusions; and (3) if so, on what grounds.

"I have etc.,

"(Sd.) H. C. E. ZACHARIAS,
"*Secretary.*

"UNDER SECRETARY,
"FEDERATED MALAY STATES,
"KUALA LUMPUR."

"KUALA LUMPUR,
"No. 3578/17. "*14th August, 1917.*

"SIR,

"I am directed to acknowledge receipt of your letter dated the 3rd August, 1917, and to inform you that the letter of the Chairman of your Association, dated the 27th December, 1916, was not sent to the Government of Madras. There were statements in it that this Government would not have been prepared to support.

"2. The Government of Madras has asked this Government to go into the question of medical relief for estate labourers belonging to India and is evidently not satisfied with present arrangements. It is necessary that the Government of the Federated Malay States should comply with the demands of the Government of Madras in so far as they may be considered not unreasonable and the question is now under consideration.

"3. The Government of Madras has suggested for the consideration of His Excellency the High Commissioner the desirability of introducing a scheme for the taking over of estate hospitals and disponsaries by Government.

"The suggestion is now being considered, and the Chief Secretary would be glad if the Committee of the Planters' Association of Malaya would favour him with their views on it.

"I have, etc.,

"(Sd.) S. McARTHUR,
"*Under Secretary to Government, F.M.S.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

MR. MOOIJAART enquires what was meant by the expression "qualified men", qualified dresser, or an Indian Assistant Surgeon or an Assistant Surgeon from the Singapore Medical School?

Mr. KINDERSLEY observes that the proposals made by Government were of a very far-reaching nature and he, therefore, thinks it advisable that the matter be referred to the Standing Committee for investigation.

This is agreed to.

15.—EUROPEAN HOSPITALS.

The SECRETARY points out that the Kuala Selangor District Planters' Association had put forward a proposal under this heading, but had informed him that they did not wish to proceed.

The Taiping Planters' Association on the other hand had referred to them the proposal that a Sub-Committee of Estate Doctors and Planters be appointed to report on all Government District Hospitals.

Mr. TATE observes that it was a fact that all Government hospitals outside Kuala Lumpur were not much better equipped now than they were in the past when there were hardly any planters or other unofficial Europeans in the country. The lack of the necessary appliances was a very serious matter.

Dr. DIXON in support of what Mr. Tate had just said says that there could be no doubt that the absence of X-ray apparatus at the Taiping Hospital was being very seriously felt. Case after case had occurred in which men had to go to other countries to obtain proper treatment. Surely it was not asking too much to expect that all European hospitals should be medically and surgically made efficient. Of course when it came to the employment of specialists

the Government would have to re-adjust their scale of pay and this would have to be done in any case if the medical service was to be improved. At the present moment a medical man working in the Government service after about 15 years of hard work could expect a salary of $500 a month with the prospect of a pension of £360 a year. That obviously was not much of an inducement for keen men to join the service. He remembered when he was working at the School for Tropical Diseases that he saw an advertisement asking for medical men to join the Federated Malay States Government service. The advertisement ended "married men must have private means." As long as the Federated Malay States pursued that kind of policy there would obviously be no chance to look for any improvement in a state of affairs which was neither creditable to the Government nor beneficial to the inhabitants of the country. He had no wish to say anything against any Government Medical Officer personally but he did maintain that the whole system was wrong and bad and he trusted that the Association would do their best to make the Government change it promptly and radically. (Applause.)

Dr. KINGSLEY fully corroborates the views expressed by Dr. Dixon.

Mr. MOOIJAART says that some four years ago the Government turned down a recommendation of their's for the improvement of the present means of conveying patients to hospital and he thinks it time that the matter was brought up again.

Mr. TATE thinks that the meeting was in favour of the Planters' Association of Malaya making the necessary representations to Government and he would propose that the Standing Committee be instructed accordingly.

Agreed.

16.—STATISTICAL BUREAU.

The SECRETARY reminds the meeting that this question had been discussed at their Annual Meeting. Since then the Honourable Mr. W. F. Nutt had raised the point at the recent Federal Council Meeting held at Kuala Kangsar. He was then reported to have said that the question of a Bureau of Statistics had been brought up by the Chamber of Commerce, who had asked that Government as soon as possible create such a bureau so that planters and commercial men could obtain statistics necessary for them in their work. At present statistics could be obtained from various officers but there was no means of centralizing them. The Honourable Mr. R. C. M. Kindersley had supported Mr. Nutt's request for such a bureau which he considered was very badly wanted in this country.

He takes it that the Association was fully endorsing this request and enquires whether it was the wish of the meeting that he should inform the Government to that effect.

MR. BENNETT proposes, MR. TAYLER seconds and it is carried unanimously that the Secretary write to the Government accordingly.

17.—PREVENTION OF MALARIA ENACTMENT.

The SECRETARY reads the following letter:

"SUNGEI SIPUT,
"PERAK,
"*21st June, 1917.*

"DEAR SIR,

"With regard to the proposal of Government to include malaria in the Infectious Diseases Enactment may I point out to you, if you have not already noticed the matter yourself, that under the powers to be taken:

"The public, including planters, may be called upon to institute and pay for (1) measures which are perfectly useless;

"(2). Measures which, though probably efficacious to a slight extent, yet are so very incommensurate with the cost;

"(3). Measures which, though effective, are very costly, while equally effective and not costly methods are available.

"For example there is nothing in the bill to prevent a rule being made that an estate should put in a $30,000 subsoil drainage scheme which would:

"(*i*) *Probably be perfectly inefficacious*;

"(*ii*) *If efficacious at all, only to such a slight extent that the results would be very incommensurate with the cost*;

"(*iii*). If effective, be very costly, while an wholly effective measure *my jungle method* which costs nothing, is available.

"As I say there is nothing in the bill to prevent that sort of thing happening—in fact I think it will—and planters must protect themselves if they do not desire it.

"Yours faithfully,

"(Sd.) C. STRICKLAND,
"*Acting Medical Officer, Sungei Siput Estates' Hospital.*

"THE SECRETARY,
"PLANTERS' ASSOCIATION OF MALAYA,
"KUALA LUMPUR."

Mr. JEAVONS thinks that this was just the sort of point to discuss at the Medical Conference the holding of which Mr. Mooijaart had proposed earlier in the meeting.

Mr. FERGUSON thinks the Enactment which had been proposed was of a very far-reaching nature and he feels certain that they should not submit tamely to such drastic and unnecessary legislation being sprung on them.

They had just heard what Dr. Strickland had to say on the subject and it was inconceivable that the desired results could not be brought about under a less harsh method.

He would therefore propose " that this Association views with considerable apprehension the powers which Government confer upon Boards of Health under the Prevention of Diseases Enactment. While anxious to co-operate with Government in any movement towards this end, the members feel, in conjunction with local practitioners, that treatment and prevention of malaria is only yet in the experimental stage, and should be further investigated before enacting upon definite methods of prevention.

In place of the proposed Enactment, the members would recommend extension of the powers already vested upon the Health Officers and Immigration Authorities, to include small holdings at present outside the provisions of the Labour Code.

Mr. KINDERSLEY is afraid that the resolution is not quite correct as it speaks of proposed legislation whilst as a matter of fact the Enactment had actually been passed by the Federal Council on the 8th of August and been gazetted on the 24th of August although it would not come into force until the Chief Secretary had notified the date in the *Gazette*.

Mr. RITCHIE enquires how the carrying out of this Enactment would affect the power of the Rural Boards and he would like the Association to obtain first of all legal opinion as to whether the Rural Boards have the power to stop any expenditure ordered under this Enactment.

The Honourable Mr. J. R. O. ALDWORTH says that Rural Boards of course existed inasmuch as the machinery was there ready but that hitherto it had hardly ever been found necessary to put it into operation. Managers had so far been satisfied to leave it to the Controller of Labour and not made use of their rights of appeal to Rural Boards.

Dr. DIXON thinks the chief objection was that the Enactment was carried through without consulting the estate doctors. Certainly he knew of not a single estate doctor whose opinion had been invited. What he could not understand was why Government did not make a free gift of a block of two to three thousand acres of land on the understanding that the owner was to open up the land according to the ideas of the Government Health Department. This would be a good test of their ideas.

Mr. KINDERSLEY suggests that Dr. Watson be invited to write accordingly for the Association a memorandum on the subject and that the matter be brought up again at the next meeting.

This is agreed to, and the meeting terminates at 1.15 p.m.

H. C. E. ZACHARIAS,
Secretary.

APPENDIX.

COPY.

GULA, PERAK, F.M.S.,
10th September, 1917.

THE DISTRICT OFFICER (KRIAN),
PARIT BUNTAR.

SIR,

I have the honour to submit herewith a report on the working of toddy-shop on Kalumpong Estate for the month of August.

As arranged with you this shop was taken over by the estate as from the 1st August on the following terms, rental to be two-fifths of the gross sales, the shop to be entirely under the control of the manager, the coolies to participate in some form or other in all profits made from the sale of toddy in the shop, and that separate accounts and separate banking account be kept.

I think it will be of interest to compare the working of the shop under European supervision with that of the Kling toddy-shop-keeper. The gross sales under estate supervision during August amounted to $1,270.80, but I may point out that during the first half of the month the shop was only open for a few hours each day as the amount of toddy available for sale was nothing like sufficient to meet the demand and I have little doubt that had there been sufficient toddy to meet the demand that the sales would probably have reached $1,500.

If you will refer to the monthly returns sent to you by the Kling toddy-shop-keeper, you will find that, from the 1st January to 31st July, that his average monthly sales amounted to about $725 only, it therefore seems perfectly clear that he was falsifying his books. His monthly rental was $301, and I estimate his actual profit at somewhere in the neighbourhood of $1,000 a month.

This man rented 100 trees monthly from the estate and apparently he always had an abundant supply of toddy to meet all demands, and in fact his books showed that he was rejecting from 10 to about 20 gallons toddy daily.

Since the estate took the shop over it has been found that the amount of toddy from 100 trees is nothing like sufficient to meet the demand, and you will note from the account of daily transactions that from the 10th of the month a further 80 trees had been opened out so as to give a sufficient supply of toddy.

In the light of this result one must conclude that the Kling toddy-shop-keeper was diluting and adulterating his toddy to an extraordinary degree.

The coolies are now being supplied with good, fresh, wholesome toddy and they highly appreciate the change.

There was an entire absence of drunkenness during the month and a marked improvement in discipline was noticeable.

I may also mention that the estate's annual Kling festival was held on the 3rd, 4th, and 5th, of the present month (September) and that the amount of toddy from 180 trees was very far short of what was actually required to meet the demand on these days, and in fact the shop was only open for about four hours daily. Compare this with conditions obtaining in previous years when there was apparently an abundant supply of toddy on these festival days from 100 trees only.

To what extent adulteration was taking place on these occasions under Kling supervision can quite well be left to one's own imagination.

I can only add that during the festival this year that drunkenness was non-existent and discipline perfect, while in previous years drunken brawls during festival days amongst the coolies were frequent and on one occasion police assistance had to be called in.

I have no doubt whatever in my own mind that adulterated toddy was the sole cause of trouble on these occasions in previous years.

The working of this toddy-shop under estate supervision has, so far, had the most gratifying results, not only from the estate's point of view, but also from the point of view of the cooly.

Government, by taking two-fifths of the gross sales, will, in this particular case, get a revenue nearly double that obtained by the system of tender.

I shall be glad to furnish you with any further particulars you may wish to have.

I have, etc.,

(Sd.) J. W. KENNEDY,
General Manager.

Abstract of Meteorological Readings in the various Districts of Malaya for the month of May, 1917.

District.	Mean Barometrical Pressure at 32° Fah.	Maximum in Sun.	Temperature.				Hygrometer.				Prevailing Direction of Winds.	Total Rainfall.	Greatest Rainfall during 24 hours.
			Mean Dry Bulb.	Maximum.	Minimum.	Range.	Mean Wet Bulb.	Vapour Tension.	Dew Point.	Humidity.			
Kelantan, Kota Bahru	...	141.8	82.21	91.67	73.5	18.17	76.8	.815	73.1	74.0	...	9.07	1.82
Pahang, Kuala Lipis	...	...	81.36	90.09	73.22	16.87	76.29	...	...	...	...	10.44	3.95
Johore, Johore Bahru	...	...	...	88.18	73.84	14.34	...	...	...	...	...	9.37	
Singapore, Kandang Kerbau ...	29.788	164.0	83.3	85.1	75.1	10.0	78.23	.891	...	73.66	...	7.12	2.28
Malacca, Durian Daun ...	...	...	...	...	...	...	...	...	...	...	...	1.59	.88
Negri Sembilan, Seremban ...	...	153.0	79.7	88.5	71.9	16.6	75.6	.815	73.1	84.2	N.W.	7.61	1.33
,, Kuala Pilah ...	...	139.1	81.9	89.6	73.9	15.7	78.8	.920	76.9	85.9	...	10.65	3.11
,, Port Dickson...	...	115.0	81.3	86.5	74.1	12.4	77.5	.876	75.1	81.3	...	4.58	1.44
Selangor, Kuala Lumpur ...	29.777	141.4	80.4	88.0	73.9	14.1	76.7	.862	74.1	81.0	Calm.	17.06	5.35
,, Klang	...	...	80.1	84.9	73.6	11.3	76.7	...	...	...	...	6.81	2.19
,, Kuala Selangor ...	...	...	...	88.0	74.8	13.2	...	...	...	...	...	3.25	1.25
,, Rawang	...	...	...	91.6	...	...	...	...	...	...	...	7.33	1.88
Perak, Telok Anson	...	...	82.27	92.0	69.0	23.0	77.9	.899	...	83.0	...	5.70	1.29
,, Ipoh	...	...	82.22	94.0	70.0	24.0	77.05	.861	74.45	79.0	...	6.69	1.41
,, Taiping	...	113.0	81.78	92.0	72.0	20.0	77.38	.880	...	83.0	...	13.77	2.48
,, The Cottage	...	...	...	...	...	...	...	...	...	...	...	32.67	4.64
,, Parit Buntar	...	...	83.10	92.0	71.0	21.0	78.27	.902	...	81.0	...	7.55	3.11
Penang Georgetown	29.773	151.5	82.6	88.5	71.9	16.6	77.2	.861	...	77.6	N.	13.89	4.40
Kedah, Alor Star	...	...	...	...	...	...	...	...	...	...	...	7.69	1.43
Perlis, Kangar	...	...	...	88.16	74.19	13.97	...	...	...	...	...	10.79	1.47